Home Telehealth
HL7 Functions Overview

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Change Record

Date	Author	Version	Change Reference
9/20/04	George Blankenship	1.0	Initial Version
10/21/04	George Blankenship	1.0.1	For review by HL7 stakeholders
11/2/04	George Blankenship	1.0.2	Addition of dialogue tables
11/4/04	George Blankenship	1.0.3	Correct observation and MPI message examples
11/22/04	George Blankenship	1.0.4	Application error codes Function priorities
11/23/04	George Blankenship	1.0.5	Correct PID segment in observation message Remove distribution control
12/2/04	George Blankenship	1.0.6	Change MPI interface to use QBP/RSP messaging Change all examples to use the same PID Correct patient VA identity (ICN, SSN, DFN) formats Add VA definitions for MSH and PID segments Add VA definitions for VA patient identity and VA facility
12/8/04	George Blankenship	1.0.7	Add VA definitions for ORC, OBR, and OBX segments Change the term "Home Telehealth Sign up" to "Home Telehealth Sign up" Creation of Home Telehealth vendor server DFN
1/24/05	George Blankenship	1.0.8	Clarify patient sign up vendor processing
1/31/05	George Blankenship	1.0.8	Correct and clarify MSH and PID segments
1/31/05	George Blankenship	1.0.8	Define and clarify PD1 segment
1/31/05	George Blankenship	1.0.8	Add definition of PV1, QPD, RCP, QAK, and EVN segments
2/1/05	George Blankenship	1.0.8	Correct observation names and qualifiers
2/2/05	George Blankenship	1.0.8	Table of acronyms and glossary of terms used in the document
2/2/05	George Blankenship	1.0.8	Added tables to define location of all required data items in the appropriate sections
2/3/05	George Blankenship	1.0.8	Clarify MPI update subscription (QBP/RSP)
2/8/05	George Blankenship	1.0.8	Update overview section to reflect changes
2/21/05	George Blankenship	1.0.9	Standard names for Home Telehealth consult and progress notes
2/22/05	George Blankenship	1.0.9	Merge of *activation* with *Sign Up* (ADT-A04)
2/22/05	George Blankenship	1.0.9	Change *deactivation* to *inactivate* (ADT-A03)
2/22/05	George Blankenship	1.0.9	Data validation rules for PID, PD1, and PV1 fields
2/22/05	George Blankenship	1.0.9	Progress note message formats
3/2/05	George Blankenship	1.2	Correct heading for table 43
3/2/05	George Blankenship	1.2	VUID for vital identifiers (Table 84)
3/2/05	George Blankenship	1.2	VUID for vital qualifiers (Table 85)
3/2/05	George Blankenship	1.2	VUID for lab result identifiers (Table 86)
3/3/05	George Blankenship	1.2	Update Table 79 for missing required segment
3/3/05	George Blankenship	1.2	Update Table 79 for missing or malformed Consult number
3/3/05	George Blankenship	1.2	Clarify Table 43 and Table 80 for observation equipment field OBX-18
3/3/05	George Blankenship	1.2	Updated Sign Up message examples (Figure 3, Figure 4, and Figure 5)
3/3/05	George Blankenship	1.2	Updated MPI subscription message examples (Figure 17, Figure 18, Figure 19, and Figure 20)
3/3/05	George Blankenship	1.2	Update Observation message examples (Figure 8, Figure 9, Figure 10, Figure 11, Figure 12, Figure 13, Figure 14, Figure 16)
3/16/05	George Blankenship	1.2	Definition of ORC-13 and PL field
3/16/05	George Blankenship	1.2	Clarification of ORC-17
3/17/05	George Blankenship	1.2	Update error number table (Table 79)
3/17/05	George Blankenship	1.2	Consistent use of facility name and facility number and removal of references to station
3/18/05	George Blankenship	1.2	Update 28-day progress note to reflect TIU direction
3/21/05	George Blankenship	1.3	Clarify observation label (OBR-4/0BX-3) and qualifier (OBX-5)
4/13/05	George Blankenship	1.3	Correct VistA sign up application
4/13/05	George Blankenship	1.3	Clarify validation rule for DOB

Date	Author	Version	Change Reference
4/19/05	George Blankenship	1.3	CDS interface to RDV and VistA Web
4/19/05	George Blankenship	1.3	Remove confusion between names in the SOW and names being used
4/28/05	George Blankenship	1.3	Clarify MPI update processing
4/29/05	George Blankenship	1.3	Change "Home Telehealth self/device entered" to "self/device entered"
4/29/05	George Blankenship	1.3	Add VUID to OBX units
4/29/05	George Blankenship	1.3	Correct TXA--2/3 to reflect change from progress note to consult note
5/1/05	George Blankenship	1.3	Clarification of the VIE use of sockets
5/4/05	George Blankenship	1.4	Clarification of units representation
5/24/05	George Blankenship	1.4	Clarification of the VIE interface (Appendix A)
5/24/05	George Blankenship	1.4	Application name corrections (Table 81)
5/30/05	George Blankenship	1.4	VA Test Environnent (Appendix A)
6/9/05	George Blankenship	1.5	Correct PAIN as self entered for CDS (VistA Web)
6/13/05	George Blankenship	1.5	Correct PIMS application name in Table 94
6/14/05	George Blankenship	1.5	Clarify lengths used by the VA in XPN and XAD HL7 components
6/14/05	George Blankenship	1.5	Clarify error codes for PID problems (Table 79)
6/15/05	George Blankenship	1.5	Clarify care coordinator encoding in PD1
7/5/05	George Blankenship	1.5	Explanation of observation cluster
7/6/05	George Blankenship	1.5	Explain message recovery algorithm
7/6/05	George Blankenship	1.5	Clarify the TIU application name
7/6/05	George Blankenship	1.5	Correct various message examples
7/6/05	George Blankenship	1.5	Clarification of VA use of facility names
8/23/2005	George Blankenship	1.6	Clarification of commit and application acknowledgement format and processing
8/29/2005	George Blankenship	1.6	Clarification of the MSH segment
8/29/2005	George Blankenship	1.6	Clarification of the ERR segment (Table 77)
8/30/2005	George Blankenship	1.6	Clarification of the validation algorithm for names
8/30/2005	George Blankenship	1.6	Clarify that MPI error messages (Table 79) include update messages.
8/30/2005	George Blankenship	1.6	Clarify VUID/text relationship (Section 5)
8/30/2005	George Blankenship	1.6	Correct observation message examples (Figure 8, Figure 9, Figure 10, Figure 11, Figure 12, Figure 13, and Figure 14)
8/30/2005	George Blankenship	1.6	Correct *record linking action* value (Table 47)
8/30/2005	George Blankenship	1.6	Clarify case sensitivity in OBX segment (Table 39, **Error! Reference source not found.**Table 40, Table 41, and Table 42)
8/30/2005	George Blankenship	1.6	Clarify the used fields of the TXA segment (Table 63).
8/30/2005	George Blankenship	1.6	Clarify the required/optional segments in a Home Telehealth message.
8/30/2005	George Blankenship	1.6	Clarify data validation rules (Table 4).
8/31/2005	George Blankenship	1.6	Allow for "entered in error" result status in OBR-25 (Table 35).
10/20/2005	George Blankenship	1.7	Clarify relationship between PV1-5 and TXA--12
10/20/2005	George Blankenship	1.7	Correct missing references
10/20/2005	George Blankenship	1.7	Correct the Home Telehealth standard document titles (Table 91)
10/20/2005	George Blankenship	1.7	Define facility numbers used by Home Telehealth (Table 9)
10/20/2005	George Blankenship	1.7	Correct message examples
10/22/2005	George Blankenship	1.7	Clarify processing of duplicate messages (Table 79)
10/22/2005	George Blankenship	1.7	Clarify processing of messages from incorrect sources (section Appendix A)
11/2/2005	George Blankenship	1.8	Clarify message ACK processing
11/8/2005	George Blankenship	1.8	Clarify application ACK processing
11/9/2005	George Blankenship	1.8	Transmission log
11/21/2005	George Blankenship	1.8	Clarify VA application names (Table 81)
11/21/2005	George Blankenship	1.8	Clarify construction of MSH-10
11/21/2005	George Blankenship	1.8	Clarify use of standardized qualifiers
11/21/2005	George Blankenship	1.8	Correct table within table (Table 6)
11/22/2005	George Blankenship	1.8	Correct table formatting
2/12/2006	George Blankenship	1.9	Suggested log entry format
2/15/2006	George Blankenship	1.10	HL7 message for census message
2/15/2006	George Blankenship	1.10	Clarify "out-of-bounds" progress note
2/28/2006	George Blankenship	1.10a	Correct "out-of-bounds" progress note name

Date	Author	Version	Change Reference
3/7/2006	George Blankenship	1.11	Clarify processing of MSH-11 (processing ID)
4/26/2006	George Blankenship	2.12	MSH-3, MSH-4, MSH5, and MSH-6 must be upper case
4/26/2006	George Blankenship	2.12	Time stamp (TS) validation and usage
5/5/2006	George Blankenship	2.12	Clarify "out-of-bounds" progress note (Subsequent Evaluation)
5/8/2006	George Blankenship	2.12	Clarify MSH-16 settings for ACK message
7/23/2006	George Blankenship	2.13	Clarification of CCHT stop codes (6843/684)
7/23/2006	George Blankenship	2.13	Clarification of A43 processing
7/24/2006	George Blankenship	2.13	Clarify contents of 28 day progress note with no data
7/24/2006	George Blankenship	2.13	Correct the placement of time stamp in TXA segment
7/26/2006	George Blankenship	2.13	Clarify the use of the patient name and address in PID segment
7/26/2006	George Blankenship	2.13	Add Home Telehealth Clinic to progress note (PV1 segment)
7/28/2006	George Blankenship	2.13	Clarify the use of consult number in sign up and progress note transactions
8/1/2006	George Blankenship	2.13a	Clarify non-supported values in MSH-15 and MSH-16
8/29/2006	George Blankenship	2.13b	Change names for progress notes
8/29/2006	George Blankenship	2.13b	Clarify the contents of the data lines in the 28-day progress note example (Figure 39) and figures (Figure 30, Figure 31, Figure 32 and Figure 33)
11/20/2006	George Blankenship	2.14	Correct the references to name table (XPN) in PID
11/20/2006	George Blankenship	2.14	Clarify the supported address type (mailing address)
11/20/2006	George Blankenship	2.14	Clarify the date/time and time stamp format
12/11/2006	George Blankenship	2.14	Clarify the data collection session in OBR-7
12/11/2006	George Blankenship	2.14	Addition of event time stamp for "out-of-bounds" progress note
4/11/2007	George Blankenship	2.14	Clarify heading line for 28-Day Progress Note
4/12/2007	George Blankenship	2.14	Clarify recovery from missing message or application acknowledgement
4/12/2007	George Blankenship	2.14	Define protocol to be used when bypassing the VIE
4/21/2008	George Blankenship	2.15	Change Medical Order function to priority three (future requirement)
4/21/2008	George Blankenship	2.15	Clarify the Home Telehealth vendor processing requirements for ADT-A04 (sign up function)
4/22/2008	George Blankenship	2.15	Clarify the definition of "data verification" (Glossary)
4/22/2008	George Blankenship	2.15	Clarify the use of the ICN to identify patients. The DFN and SSN are not used to identify patients that are VistA Integrated.
4/22/2008	George Blankenship	2.15	Clarify the Home Telehealth vendor processing requirements for ADT-A03 (inactivation function)
4/22/2008	George Blankenship	2.15	Clarify the use of the Filler Order Number in an ORU message. The Filler Order Number is used to identify an observation.
4/23/2008	George Blankenship	2.15	Clarify the MPI update messages and processing requirements
4/24/2008	George Blankenship	2.15	Clarify use of the VIE infrastructure
4/24/2008	George Blankenship	2.15	Correct the contents of PV1-19
4/24/2008	George Blankenship	2.15	Clarify the use of OBX-2 in MDM-T02 messages when the OBX segment contains a text string.
4/24/2008	George Blankenship	2.15	Correct incorrect use of "sign up" in the inactivation section when "inactivation" should have been used.
4/25/2008	George Blankenship	2.15	Clarify the generation of a new visit for the standard clinic associated with progress notes.
4/27/2008	George Blankenship	2.15	Correct TXA segment field usages for progress notes
4/27/2008	George Blankenship	2.15	Correct progress note examples
4/27/2008	George Blankenship	2.15	Clarify error codes for ADT-A04 and ADT-A04
4/27/2008	George Blankenship	2.15	Correct formatting of footnote references
4/28/2008	George Blankenship	2.15a	Correct formatting of HL7 field and component names
6/4/2008	George Blankenship	2.15b	Clarify DNS for VistA HL7 listener
8/29/2008	George Blankenship	2.16	Revise the algorithm for the generation of the Summary of Episode progress note, clarify the collection line for dialogs, and correct general name to reference the note
8/30/2008	George Blankenship	2.16	Clarify time stamp data quality criteria
8/30/2008	George Blankenship	2.16	Clarify patient identification data quality criteria
9/1/2008	George Blankenship	2.16	Clarify VistA HL7 listener DNS
12/16/2008	George Blankenship	2.17	Clarify text lines of a progress note

Date	Author	Version	Change Reference
12/16/2008	George Blankenship	2.17	Clarify the application names used in messages sent to the HDR (ORU-R01)
12/16/2008	George Blankenship	2.17	Clarify the requirement to request application acknowledgement from the HDR.
12/16/2008	George Blankenship	2.17	Switch to using Commit Acknowledgement for any message that is in response to a request in MSH-15. Clarify the term "message acknowledgement".
12/16/2008	George Blankenship	2.17	Clarify the format for survey response submission.
12/16/2008	George Blankenship	2.17	Clarify the source of the facility name and number of a VistA facility (VAMC) supporting a patient.
12/17/2008	George Blankenship	2.17	Updated and reformatted references section
12/17/2008	George Blankenship	2.17	Clarified actions to be taken when an unprocessable message is received
1/23/2009	George Blankenship	2.17a	Correct DFN validation rules
1/30/2009	George Blankenship	2.17a	Correct footnote for MPIF TRIGGER application
2/4/2009	George Blankenship	2.17a	Correct textual content of Summary of Episode Progress Note
2/6/2009	George Blankenship	2.17a	Clarify MPI usage of QAK-1
2/10/2009	George Blankenship	2.17b	Clarify the message types that are not to request an application ACK in MSH-16.
2/10/2009	George Blankenship	2.17b	Clarify that the MFN-M05 message is not supported by Home Telehealth.
2/17/2009	George Blankenship	2.17c	Correct name of the screening consult – "CONSULT" is not part of the name
3/13/2009	George Blankenship	2.17d	Correct length of DFN
3/13/2009	George Blankenship	2.17d	Clarify the comparison of two DFNs
3/13/2009	George Blankenship	2.17d	Clarify the processing of a CR/CE when an application acknowledgement is also requested.
3/19/2009	George Blankenship	2.17e	Clarify progress note example (Figure 39)
6/3/2009	George Blankenship	2.18	Clarify phone number encoding in PID segment
6/3/2009	George Blankenship	2.18	Clarify address encoding in the PID segment
6/8/2009	George Blankenship	2.18	Clarify the use of VA facility numbers for a patient sign up/activation (ADT-A04 transaction)
6/9/2009	George Blankenship	2.18	Clarify MPI update parameters
6/9/2009	George Blankenship	2.18	Clarify MPI update application name
9/8/2009	George Blankenship	2.18a	Clarify contents of PV1-44 and PV1-45 (in Table 25: VA PV1 Segment)
9/8/2009	George Blankenship	2.18a	Clarify the generation date for summary of episode progress notes
9/8/2009	George Blankenship	2.18a	Clarify the contents of MSH-17
9/8/2009	George Blankenship	2.18a	Correct PID examples
9/8/2009	George Blankenship	2.18a	Clarify the difference between a null HL7 field and the null string
9/8/2009	George Blankenship	2.18a	Correct missing field (ZIP code) in Table 18
9/22/2009	George Blankenship	2.18b	Add error code for legacy patient sign up errors (Table 79)
9/22/2009	George Blankenship	2.18b	Correct error text for PID errors (Table 79)
9/21/2009	George Blankenship	2.18b	Clarification of PID validation rules
9/21/2009	George Blankenship	2.18b	Clarify that the proper response for a message that cannot be processed is either a Cx (if Ax is not requested) or Cx with an Ax.
9/28/2009	George Blankenship	2.18.c	Add error text when a message was not processed due to "non supported message type"
2/18/2010	George Blankenship	2.19	Clarify patient demographics update by A04
2/18/2010	George Blankenship	2.19	Clarify patient selection in MPI originated A31
2/22/2010	George Blankenship	2.19	Clarify the optional fields of a time stamp (TS) data type and the required fields for all vendor generated time stamps
2/22/2010	George Blankenship	2.19	Clarify the contents of MSH-7 (date/time of a message)
8/3/2010	George Blankenship	2.20	Clarify the rules for validating PID contents
8/3/2010	George Blankenship	2.20	Clarify the definition of legacy and integrated patient
2/23/2011	George Blankenship	2.21	Document HL7 message envelope in TCP socket (MLLP)
2/23/2011	George Blankenship	2.21	Document MPI "not used" component encoding
2/23/2011	George Blankenship	2.21	Remove the CDS Interface to RDV appendix
2/23/2011	George Blankenship	2.21	Remove the CDS Interface to VistA Web appendix
2/23/2011	George Blankenship	2.21	Add appendix defining the alignment of the primary Care Coordinator with Care Coordinator in PD1-4.

Date	Author	Version	Change Reference
10/26/2011	George Blankenship	2.22	Clarify socket interface for the VIE bypass
10/26/2011	George Blankenship	2.22	Clarification of ITL and production configuration information
10/26/2011	George Blankenship	2.22	Clarification of HDR Application ACK
10/27/2011	George Blankenship	2.22	Clarification for error message contents in Table 79
11/16/2011	George Blankenship	2.22	Update ITL configuration (Table 101) with HDR definition
11/16/2011	George Blankenship	2.22	Update Production configuration (Table 102) with HDR definition
11/17/2011	George Blankenship	2.22	Clarification of the time stamp of Activation and Inactivation requests
12/7/2011	George Blankenship	2.22a	DNS for VistA system 552 in ITL (Table 101)
1/26/2012	Chris Woodyard	2.23	Added new Section 3.9 and Appendix H
2/3/2012	George Blankenship	2.23	Clarified Cx and Ax processing in DMP section (119)
2/3/2012	George Blankenship	2.23	Adjusted the formatting of Figure 59
2/3/2012	George Blankenship	2.23	Clarified the processing of the A43 message from the MPI
3/1/2012	George Blankenship	2.23	Split Census and Survey into two separate sections
7/17/2012	George Blankenship	2.23a	Define the VistA Standard Name Format
7/17/2012	George Blankenship	2.23a	Require the use of the VistA Standard Name Format for all name complarisons
8/3/2012	George Blankenship	2.23a	Clarify that the vendor help desk must be prepared to explain HL7 message error messages and the exact reason for the error message.
10/24/2012	George Blankenship	2.23b	Add HDR and scoring to DMP Response section
10/24/2012	George Blankenship	2.23b	Add "entry error" to ORU definition so that submissions that do not meet the date/time business rules can be sent to the HDR.
10/24/2012	George Blankenship	2.23b	Correct formatting
10/26/2012	George Blankenship	2.23c	Clarify Error Reasons QBX qualifier
3/28/2013	George Blankenship	8.0	Bring document version into alignment with SharePoint document version
3.28.2013	George Blankenship	8.0	Update HDR entrance URI
5.10.2013	George Blankenship	9.0	Update Census message (section 3.8) to include version information in OBX-3
5.10.2013	George Blankenship	9.0	Update DMP message (section 3.10) to include version information in OBX-3
5.10.2013	George Blankenship	9.0	Update Survey message (section 3.9) to include version information in OBX-3
5.10.2013	George Blankenship	9.0	Update Census XSD and element names (Appendix H)
5.10.2013	George Blankenship	9.0	Update DMP XSD and element names (Appendix I)
5.10.2013	George Blankenship	9.0	Update Survey XSD and element names (Appendix J)

Reviewers

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Contents

1 Overview 18
2 Data Flows 19
3 Functions 22
3.1 Patient Sign up 23
3.1.1 Description 24
3.1.2 Responsibilities 24
3.1.3 Required Data Items 27
3.1.4 Data Nomenclature 30
3.1.5 Sign up Message Content 30
3.1.6 Acknowledge Message Content 51
3.2 Observations 52
3.2.1 Description 52
3.2.2 Responsibilities 53
3.2.3 HT Mandatory Fields 54
3.2.4 Data Nomenclature 55
3.2.5 Observation Message Content 55
3.2.6 Acknowledge Message Content 71
3.3 MPI Subscription 72
3.3.1 Description 72
3.3.2 Responsibilities 73
3.3.3 Required Data Items 74
3.3.4 Data Nomenclature 75
3.3.5 MPI Subscription Message Content 75
3.3.6 QBP Acknowledge Message Content 79
3.3.7 RSP Patient Find Message Content 79
3.3.8 RSP Acknowledge Message Content 81
3.4 Patient VA Identity and Demographics Update 82
3.4.1 Description 82

3.4.2 Responsibilities 83
3.4.3 Required Data Items 84
3.4.4 Data Nomenclature 86
3.4.5 MPI Update Message Content 86
3.4.6 Acknowledge Message Content 92
3.5 Medical Order 92
3.5.1 Description 93
3.5.2 Responsibilities 93
3.5.3 HT Mandatory Fields 94
3.5.4 Data Nomenclature 95
3.5.5 Message Content 95
3.6 Inactivation 95
3.6.1 Description 96
3.6.2 Responsibilities 96
3.6.3 Required Fields 97
3.6.4 Data Nomenclature 99
3.6.5 Message Content 99
3.6.6 Acknowledge Message Content 100
3.7 Progress Notes 101
3.7.1 Description 102
3.7.2 Responsibilities 105
3.7.3 Required Fields 106
3.7.4 Data Nomenclature 107
3.7.5 Message Content 107
3.7.6 Acknowledge Message Content 112
3.8 Patient Census Submission 113
3.8.1 Description 114
3.8.2 Responsibilities 114
3.8.3 Required Fields 115
3.8.4 Data Nomenclature 115
3.8.5 Message Content 115

3.8.6 Acknowledge Message Content 117
3.9 Patient DMP Responses 119
3.9.1 Description 119
3.9.2 Responsibilities 119
3.9.3 Required Fields 121
3.9.4 Data Nomenclature 121
3.9.5 Message Content 121
3.9.6 Acknowledge Message Content 123
3.10 Patient Survey Reporting without Scoring 123
3.10.1 Description 124
3.10.2 Responsibilities 124
3.10.3 Required Fields 125
3.10.4 Data Nomenclature 125
3.10.5 Message Content 126
3.10.6 Acknowledge Message Content 127
3.11 Patient Survey Reporting with Scoring 128
3.11.1 Description 128
3.11.2 Responsibilities 128
3.11.3 Required Fields 130
3.11.4 Data Nomenclature 130
3.11.5 Message Content 130
3.11.6 Acknowledge Message Content 131
3.12 Application Acknowledge Message 131
3.12.1 Description 131
3.12.2 Responsibilities 132
3.12.3 Required Fields 132
3.12.4 Data Nomenclature 132
3.12.5 Acknowledge Message Content 132
3.13 Unprocessable Messages 138
3.14 Unsupported Messages 139
4 Field Definitions 139

5 Observation Data Items 146
6 Dialogues 150
7 Standard Home Telehealth Document Names 153
8 References 155
8.1 Web Sites 155
8.2 VA Message Profiles 155
8.3 VA HL7 Guides 156
8.4 VA Standards Specifications 156
8.5 HL7 Standard Specifications 156
8.6 Home Telehealth Specific Specifications 156
8.7 Miscellaneous Documents 157
9 Glossary 157
Appendix A. HL7 Socket Interface for VistA Integration 161
A.1 HL7 Message Transmission 161
A.2 Home Telehealth HL7 Function Transactions 161
A.3 HL7 TCP Port Usage 163
A.4 Transmission Log 164
A.4.1 Suggested Export Format 164
A.4.2 Manual Retransmission of Log Entry Data 166
A.5 Message Retransmission and Acknowledgement 166
A.5.1 Overview 166
A.5.2 Commit Acknowledgement 166
A.5.3 Application Acknowledgements 169
A.6 Port Throttling 171
A.7 Home Telehealth HL7 Integration Test Environment (ITL) 171
A.8 Home Telehealth Production Environment 173
Appendix B. Socket Interface without VistA Interface Engine 174
B.1 Outgoing TCP Ports 174
B.1.1 National Applications 175
B.1.2 VAMC Applications 175
B.2 Incoming TCP Ports 175

Appendix C. Data Quality Criteria 176
C.1 Time 176
C.2 Patient Identification 176
Appendix D. Use of VA Facility Number for a Patient Sign Up/Activation 177
D.1 VA Facility Number Background 177
D.2 Use of Facility Number to Place Patient in a Servicing Location 177
Appendix E. CDS Interface to RDV 178
Appendix F. CDS Interface to VistA Web 178
Appendix G. Alignment of the VistA and Vendor Primary Care Coordinator 178
Appendix H. Census Submission XML Format 178
Appendix I. DMP Patient Response XML Format 182
Appendix J. Survey Response XML Format (unscored) 187
Appendix K. Survey Response XML Format (scored) 191
Appendix L. VistA Standard Name Format 191
9.1 Background 191
9.2 Purpose 191
9.3 Brief Description 192
9.4 Details 192
9.4.1 POST^XLFNAME: New Person Name Conversion 192

Tables

Table 1: Acronyms and Abbreviations 18
Table 2: Function Priorities 22
Table 3: Home Telehealth Vendor Server Sign Up Data Items 27
Table 4: Data Validation Rules 29
Table 5: Home Telehealth ADT-A04 Segments 31
Table 6: VA MSH Segment 32
Table 7: VA Facility Components – DNS Format (HL7 HD Data Type) 34

Table 8: VA Facility Components – L Format (HL7 HD Data Type)..... 34
Table 9: VA Facility Numbers..... 34
Table 10: Processing ID Requirements..... 34
Table 11: Acknowledgement Type Requirements..... 35
Table 12: VA EVN Segment..... 36
Table 13: VA PID Segment..... 36
Table 14: VA Patient Identifier (HL7 CX Data Type)..... 38
Table 15: VA Patient Identifier Component Values..... 39
Table 16: VA Patient Identifier Exemples..... 39
Table 17: VA Definition for HL7 XPN Field Components (Name)..... 39
Table 18: VA Definition for HL7 XAD Field Components (Address)..... 40
Table 19: HL7 Address Type (ID)..... 41
Table 20: VA Definition for HL7 XTN Field Components (Phone Number)..... 42
Table 21: HL7 Telecommunication Use Code (ID)..... 43
Table 22: HL7 Telecommunication Equipment Type (ID)..... 43
Table 23: VA PD1 Segment..... 44
Table 24: VA Definition for HL7 XCN Field Components..... 45
Table 25: VA PV1 Segment..... 46
Table 26: VA Clinic Name in PV1-3 (HL7 PL Data Type)..... 49
Table 27: VA Consult Identifier in PV1-5 (HL7 CX Data Type)..... 50
Table 28: Home Telehealth Vendor Server Observation Data Items..... 54
Table 29: Home Telehealth ORU-R01 Segments..... 56
Table 30: VA ORC Segment..... 56
Table 31: VA Filler Order Number in ORC-3 and OBR-3 (HL7 EI Data Type)..... 58
Table 32: VA Person Location in ORC-13 (HL7 PL Data Type)..... 59
Table 33: VA Entering Facility in ORC-17 (HL7 CE Data Type)..... 59
Table 34: VA Ordering Facility in ORC-21 (HL7 XON Data Type)..... 59
Table 35: VA OBR Segment..... 60
Table 36: VA Observation Identifier in OBR-4 and OBX-3 (HL7 CE Data Type)..... 63
Table 37: VA Observation Identifier in OBR-4 and OBX-3 Examples..... 63
Table 38: VA Result Status in OBR-25..... 63

Table 39: VA OBX Segment 65
Table 40: VA Observation Qualifier or Error in OBX-5 (HL7 CE Data Type) 66
Table 41: VA Observation Unit in OBX-6 (HL7 CE Data Type) 67
Table 42: VA Observation Method in OBX-17 (HL7 CE Data Type) 67
Table 43: VA Equipment Instance in OBX-18 (HL7 EI Data Type) 67
Table 44: VA ZSC Segment 68
Table 45: Home Telehealth Vendor Server MPI Subscription Data Items 74
Table 46: Home Telehealth QBP-Q22 Segments 76
Table 47: VA QPD Segment 76
Table 48: VA QPD-3 Components for DFN Search 77
Table 49: VA RCP Segment 78
Table 50: Home Telehealth RSP-K22 Segments 80
Table 51: VA QAK Segment 80
Table 52: Home Telehealth Vendor Server MPI Update Data Items 85
Table 53: Home Telehealth ADT-A24 Segments 88
Table 54: Home Telehealth ADT-A08 Segments 89
Table 55: Home Telehealth ADT-A31 Segments 89
Table 56: Home Telehealth ADT-A43 Segments 90
Table 57: VA MRG Segment 90
Table 58: Home Telehealth Vendor Server Medical Order Data Items 94
Table 59: Home Telehealth Vendor Server Inactivation Data Items 97
Table 60: Home Telehealth ADT-A03 Segments 99
Table 61: Home Telehealth Vendor Server Progress Note Data Items 106
Table 62: Home Telehealth Progress Note MDM-T02 Segments 108
Table 63: VA TXA Segment 108
Table 64: VA Unique Document Number in TXA--12 (HL7 EI Data Type) 110
Table 65: Home Telehealth Vendor Server Patient Census Items 115
Table 66: Home Telehealth MDM-T02 Segments (Patient Census) 115
Table 67: Census Submission Identifier in OBX-3 (HL7 CE Data Type) 116
Table 68: Home Telehealth Census Submission Error Identifier/Text 118
Table 69: DMP Response Data Items 121

Table 70: Home Telehealth DMP Response MDM-T02 Segments 121
Table 71: DMP Response Observation Identifier in OBX-3 (HL7 CE Data Type) 122
Table 72: Home Telehealth Vendor Server Patient Survey Data Items 125
Table 73: Home Telehealth MDM-T02 Segments (Patient Survey) 126
Table 74: Patient Survey Observation Identifier in OBX-3 (HL7 CE Data Type)..... 126
Table 75: Home Telehealth ACK Segments..... 133
Table 76: VA MSA Segment..... 133
Table 77: VA ERR Segment..... 134
Table 78: VA Error Condition Field..... 134
Table 79: Home Telehealth Error Identifier/Text..... 134
Table 80: HL7 Field Definition 140
Table 81: VA Application Names for MSH Segment 143
Table 82: VA Home Telehealth Vendor Identifier Components..... 145
Table 83: Data Entry Methods..... 146
Table 84: GMRV Vital Sign Types 146
Table 85: GMRV Vitals Qualifier 147
Table 86: Laboratory Result Types..... 150
Table 87: Laboratory Result Qualifier..... 150
Table 88: Submission Error Qualifier..... 150
Table 89: Clinic Stop List..... 150
Table 90: Disease Dialogues..... 151
Table 91: Home Telehealth Standard Document Titles..... 153
Table 92: Home Telehealth Clinics 155
Table 93: Glossary 157
Table 94: Home Telehealth Functions/HL7 Transactions 162
Table 95: Suggested Log Entries 165
Table 96: Message Transmission Process..... 167
Table 97: Commit acknowledgement Process 168
Table 98: Transaction Transmission Process..... 169
Table 99: Application Acknowledgment Process..... 170
Table 100: VIE Assignments..... 172

Table 101: VA ITL System Assignments 173
Table 102: VA Production System Assignments (no VIE) 173
Table 103: DNS and Outgoing Port 174
Table 104: Patient Association with a Facility Number Business Rules 177
Table 105: Data Element Description for Census Submission 180
Table 106: Data Element Description for DMP Patient Response Submission 185
Table 107: Data Element Description for Survey Patient Response Submission 189

Figures

Figure 1: Home Telehealth Data Flow 20
Figure 2: Home Telehealth HL7 Functional Relationships 21
Figure 3: Sign up Request Message 51
Figure 4: Sign up Message Acceptance (Commit acknowledgement) 52
Figure 5: Sign up Request Acceptance (Application Acknowledge) 52
Figure 6: Application Acknowledge Message Acceptance (Commit acknowledgement) 52
Figure 7: Sign up Request Refusal (Application Acknowledge) 52
Figure 8: Observation Message (Temperature) 69
Figure 9: Observation Message (Blood Glucose) 69
Figure 10: Observation Message (Blood Pressure) 69
Figure 11: Observation Message (Pulse) 70
Figure 12: Observation Message (Pulse Oximetry) 70
Figure 13: Observation Message (Weight) 70
Figure 14: Observation Message (Pain) 71
Figure 15: Observation Message with Error Reasons (Pain) 71
Figure 16: Observation Acceptance (Commit acknowledgement) 72
Figure 17: MPI Subscription Message 78
Figure 18: MPI Subscription Acceptance (Commit acknowledgement) 79
Figure 19: MPI Query Response with Acceptance (Application Acknowledgement) 81

Figure 20: RSP Acceptance (Application Acknowledgement) 82
Figure 21: MPI ICN Update Message 91
Figure 22: MPI Authority Update Message 91
Figure 23: MPI Demographics Update Message (A08) 91
Figure 24: MPI Demographics Update Message (A31) 91
Figure 25: MPI Update Acceptance (Application Acknowledgement) 92
Figure 26: Inactivation Request Message 100
Figure 27: Inactivation Message Acceptance (Commit acknowledgement) 101
Figure 28: Inactivation Request Acceptance (Application Acknowledge) 101
Figure 29: Inactivation Request Refusal (Application Acknowledge) 101
Figure 30: Summary of Episode Progress Note Reporting Period Line 103
Figure 31: Summary of Episode Progress Note Reporting Line (Measurement) 103
Figure 32: Summary of Episode Progress Note Reporting Line (DMP or Dialog) 103
Figure 33: Summary of Episode Progress Note Reporting Line (no data) 103
Figure 34: “Out-Of-Bounds” Progress Note Alert Lines 104
Figure 35: Sample “Out-Of-Bounds” Progress Note Body 105
Figure 36: Summary of Episode Progress Note Header 111
Figure 37: Summary of Episode Progress Note DMP Summary Line 111
Figure 38: Summary of Episode Progress Note Measurement Summary Line 111
Figure 39: Summary of Episode Progress Note Data 112
Figure 40: “Out-of-bounds” Progress Note Data (Pulse) 112
Figure 41: Progress Note Message Acceptance (Commit acknowledgement) 113
Figure 42: Progress Note Acceptance (Application Acknowledge) 113
Figure 43: Progress Note Refusal (Application Acknowledge) 113
Figure 44: Weekly Patient Census 116
Figure 45: Weekly Patient Census Message Acceptance (Commit acknowledgement) 117
Figure 46: Weekly Patient Census Acceptance (Application Acknowledge) 117
Figure 47: Weekly Patient Census Refusal (Application Acknowledge) 117
Figure 48: Patient DMP Response 123
Figure 49: Message ACK Message 123
Figure 50: Application ACK Message 123

Figure 51: Patient Survey Response (unscored) 127
Figure 52: Patient Survey Message Acceptance (Commit acknowledgement) 128
Figure 53: Patient Survey Response Acceptance (Application Acknowledge) 128
Figure 54: Patient Survey Response Refusal (Application Acknowledge) 128
Figure 55: Patient Survey Response (scored) 131
Figure 56: Request Rejection (Application Acknowledgement) 138
Figure 57: MLLP Envelope for HL7 Message 161
Figure 58: Home Telehealth Integration Test Environment 172
Figure 59: XML XSD for Census Submission 179
Figure 60: DMP Patient Response XSD 185
Figure 61: XML Data Format for Patient Survey Response 189
Figure 62: Information stored in ^XTMP by the New Person Name Conversion 195

1 Overview

The Office of Care Coordination (OCC), through the Home Telehealth Program, is currently putting medical devices in patient homes to improve the quality of care and standard of living for veterans throughout the U.S. From the technical point of view, each vendor's medical device communicates with their central collection system (or server) located behind a VA firewall at a VA data center. A critical function of the Home Telehealth systems is their ability to communicate with existing Veteran Health Administration (VHA) computer systems, including VistA. The communication between the Home Telehealth systems and the VHA systems is based upon the use of the standard medical exchange protocol Health Level Seven (HL7).

HL7 is the VA-adopted standard for the exchange of data that supports clinical patient care, and the management and delivery of healthcare services. As a standard, HL7 is widely accepted and used both nationally and internationally. Home Telehealth vendors that participation in the program is based upon a VHA national contract that required the vendors to incorporate into their systems the ability to accept and send HL7 messages as defined by the VA. In order for medical information to be exchanged, the transaction contents must be precisely defined by the VA for use by all participants.

This document gives an overview of the major functions that must be implemented using HL7 messaging. The rest of this document is divided into an overview of the data flow, a detailed overview of each function, specifications and references. Section 2 gives the general data flows of the Home Telehealth systems and functions. Section 3 gives an overview of each of the functions that use HL7 messaging. Section 4 and the following sections contain the specifications for the HL7 data fields and the references that form the basis of this document.

Table 1 contains the acronyms and abbreviations used in this document.

Table 1: Acronyms and Abbreviations

Acronym	Description
AAC	Austin Automation Center
ADT	Admission, Discharge and Transfer
ACK	Acknowledgement
CIO	Chief Information Officer
CPRS	Computerized Patient Records System
DFN	Data File Number, a two component index consisting of an integer and a facility number
ESM	Enterprise Systems Manager
Hines	Hines Data Center
HL7	Health Level 7 protocol
HT	Home Telehealth
ICN	Integration Control Number
IE	Interface Engine
IEN	Internal Entry Number

Acronym	Description
M&IS	Messaging & Interfaces Services
MPI	Master Patient Index
OCC	Office of Care Coordination
OI	Office of Information
PD	Patient Demographics
RDV	Remote Data View
SSN	Social Security Number
TCP/IP	Transmission Control Protocol/Internet Protocol
URL	Universal Record Location
VA	Department of Veterans Affairs
VACO	Veterans Affairs Central Office
VAMC	Department of Veterans Affairs Medical Center
VIE	VistA Interface Engine
VISN	Veterans integrated service unit
VistA	Veterans Health Information Systems and Technology Architecture
VHA	Veterans Health Administration

2 Data Flows

Figure 1 depicts the overall flow of information between the Home Telehealth system and other VA systems. It also includes the general points of human interaction with the Telehealth data. The figure depicts two approaches (prior to the integration using HL7 and after the integration using HL7) and the following paragraphs describe each approach.

The process starts with the selection of the patient for Home Telehealth. The VA staff identifies a patient who might be a good candidate for Home Telehealth and creates a Consult Note (Table 91) that is posted to a Care Coordinator (step one). All of the subsequent progress notes that are created to track the patient's progress during coverage by Home Telehealth are linked to the original consult note.

Prior to the integration with the VA systems using HL7, the Care Coordinator uses a vendor server based application to assign the patient to the vendor (step two) and view the data collected through a vendor server based application (steps five, six, and nine).

After the integration of the vendor servers with the VA systems via HL7, the care coordinator has a fast and easy method to sign the patient up with a Home Telehealth vendor server with improved data quality. The care coordinator continues to have access to the existing vendor applications. VA staff can view the collected observations using VA applications (CPRS RDV and VistA web). The figure depicts the dataflow that allows the patient sign up and viewing of patient data through VA systems. Steps one through four depict the selection of a patient for Home Telehealth and the sign up with the vendor server using the VistA Home Telehealth Sign

Up application. Steps 5 though eight depict the data collected at the home, the processing of the collected data by the vendor server, and the transmission of the data to the Health Data Repository. Step 10 depicts the viewing of data by the Care Coordinator using VA applications. This document deals with the basic functions that are used to perform the integration of the vendor servers with the VHA systems. Section 3 discusses the each function in detail.

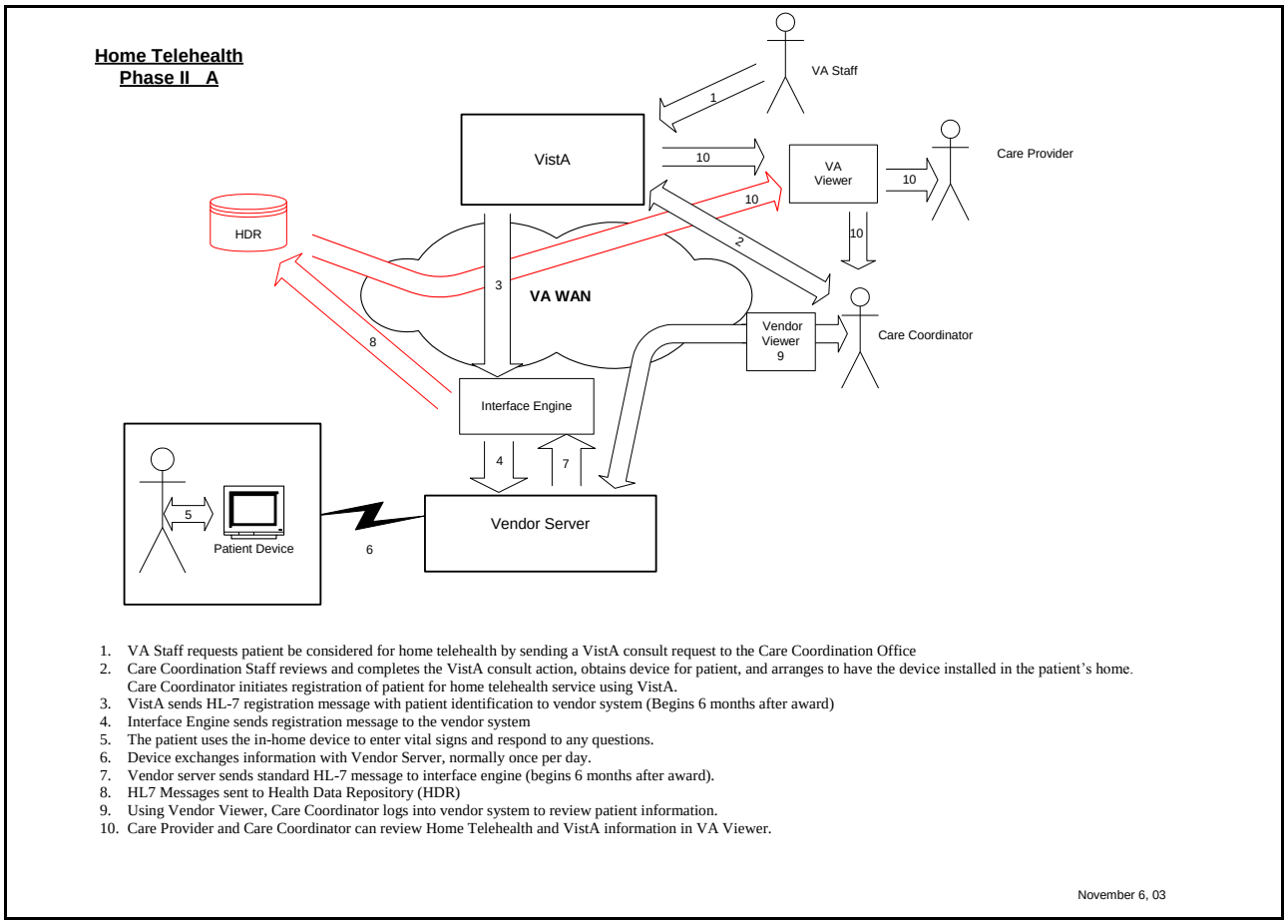

Figure 1: Home Telehealth Data Flow

Figure 2 depicts the functional relationships between the systems that comprise the Home Telehealth environment. The figure identifies whether the functions are implemented using HL7. All functions between the Home Telehealth a vendor sever and a VA system must use HL7.

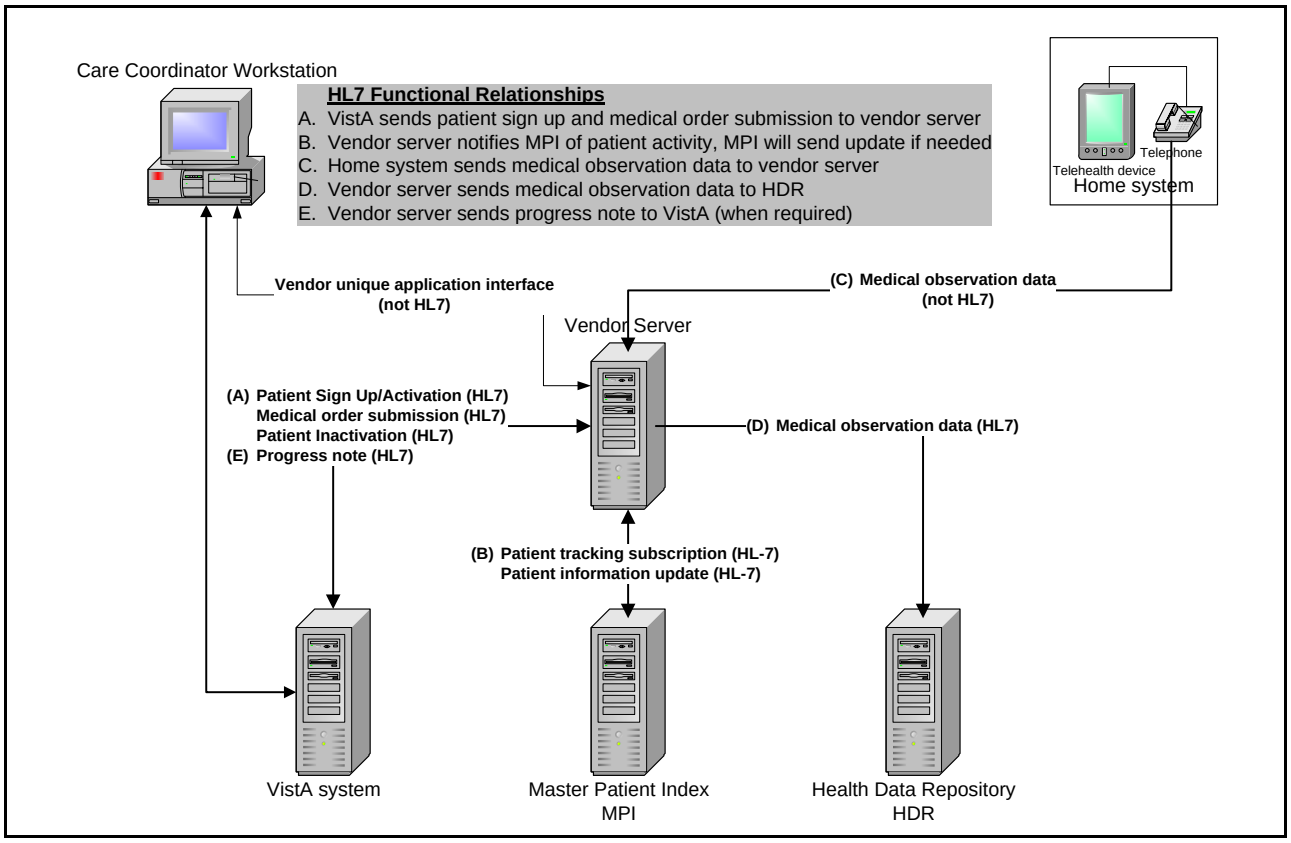

Figure 2: Home Telehealth HL7 Functional Relationships

The overall process flow consists of the following steps:

1. Clinician prepares a consult recommending the use of Home Telehealth for a VA patient and forwards recommendation to care coordination.
2. Care coordinator selects Home Telehealth vendor and initiates the sign up process. The sign up process will generate an HL7 message sent to the vendor server with patient identity, demographics, and consult information (relationship A in Figure 2). The patient identity is an index that is used to locate the patient in a database. There are three identities used by the VA. The integration control number (ICN) is the VA national patient identity. The ICN is used to locate the patient in the Master Person Index (MPI). The Data File Number (DFN) is the local patient identity used to locate the patient in a VistA facility database. The social security number (SSN) is the US national individual identity. The patient demographics include the patient first name, last name, and date of birth (DOB).
3. The vendor server generates subscription request to the MPI for updates to the patient identity linkages or demographics (relationship B in Figure 2).
4. The care coordinator prepares a medical order defining the vitals to be collected and the dialogues to be used (relationship A in Figure 2).
5. The vendor issues a home device to the patient and activates the device.

6. When the home device has collected data, the home device sends the vitals observations to the vendor server. Upon receipt, the vendor server forwards the vital observations to the Health Data Repository (HDR) (relationships C and D in Figure 2).
7. The MPI sends updates to the national identity (ICN), VistA identity (DFN), US identity (SSN), or demographics to the vendor server when it is notified of changes (relationship B in Figure 2).
8. Analysis of the collected data performed by the vendor server is the basis of draft progress notes. The vendor server sends the draft progress notes data to VistA (relationship E in Figure 2).

The overall process includes both initial system and future system HL7 requirements. Steps 2, 3, and 6 (above) are immediate HL7 integration requirements to part of the initial deployment. The rest are future requirements and will be implemented at a later stage of the program.

A network of Interface Engines (IE) is the normal transport layer for all HL7 messages within the VA. While the VIE infrastructure is capable of moving all HL7 traffic, the Home Telehealth program has elected to bypass the infrastructure where possible while the infrastructure is being upgraded. Each system is connected to a local interface engine using a TCP socket; currently this interface is not used. The validation and testing document includes the IE domain name and port number to be used by each vendor at AAC and at Hines; this information is only present for use when the program returns to use the IE infrastructure. All traffic to and from VistA, the MPI, the HDR and the Census/Survey database does not use the VIE infrastructure; the traffic moves via a TCP socket that connects the source of the HL7 message to the destination of the HL7 message. Once the VIE infrastructure has been upgraded, the program will establish a schedule to move all traffic back to the VIE infrastructure.

3 Functions

The following sections discuss each function that must be performed using HL7 messaging. The priority one functions addressed are Sign up, MPI subscription, updates from the MPI, Inactivation, Observations, Progress Notes, and Acknowledgement. The priority two functions (Medical Orders) will be address in a future revision of this document. Each section contains an overview of the function, the data items required by the function, data value definitions, HL7 message format, and examples of aL7 messages. Each function consists of a request or informational message (sections 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, and 3.8) and an acknowledgement message (section 3.9). The acknowledgement message indicates that the request or informational message was processed successfully or that the request could not be honored.

The priority one list must be implemented within six months of award. Table 2 gives the functions priority assignments.

Table 2: Function Priorities

Function	Priority	Purpose
Sign up	One	This function gives the vendor server an accurate copy of the

Function	Priority	Purpose
		patient demographics.
Observation	One	This function sends the patient vitals to the HDR server
MPI Subscription	One	This function informs the MPI that the vendor server has a copy of the patient demographics and database indices. The MPI will send updates as it detects changes.
MPI Update	One	This function informs the vendor server of an update to a patient's demographics or database index.
Acknowledgements	One	This function supplies either a commit acknowledgement (message acceptance) or an application acknowledgement (request acceptance). Every other function includes the acknowledgement function.
Medical order	Two	This function gives the vendor server the parameters needed to define the use of a home device. This function should imply an activation function.
Activation	One	This function will start (restart) the use of a home device according to the parameters from the medical order. The home VistA system can be switched using the activation function. The activation function is part of the sign up function. The activation function is used to start the collection of Summary of Episode progress note information.
Deactivation (inactivate)	One	This function will suspend the collection of vitals by a home device. Summary of Episode progress note information will not be collected during a period that a patient is inactive.
Progress alarm	One	This function will build a draft progress note containing an alarm for an "out of range" vital sign.
Progress note	One	This function will build a draft progress note containing the patient's Summary of Episode progress.
Patient census	One	This function will update the Home Telehealth patient census database.

3.1 Patient Sign up

The objective of the patient sign up function is to enter a patient in the Home Telehealth System and notify the Master Patient Index (MPI) that the vendor server contains information for the registered patient. The application acknowledgement message indicates the acceptance or non-acceptance of the sign up request. The patient sign up function also activates an inactive patient (section 3.6). Patient sign up is a priority one function.

3.1.1 Description

The data in the patient sign up HL7 message identifies the patient (local and enterprise id), the facility that is providing care, and the care coordinator. In support of the patient sign up process, Home Telehealth vendors are required to

1. accept the HL7 sign up message,
2. store the information from the sign up message in a local patient record
3. subscribe to the Master Patient Index server update service via HL7 (section 3.3),
4. start the collection of data necessary for the Summary of Episode progress note (section 3.7),
5. provide an HL7 application acknowledgement, and
6. process patient identity and demographics updates sent by the MPI server (section 3.4).

The Care Coordinator uses a VistA menu to initiate the sign up process. The basic objective of the sign up process is to either create and activate a patient in a vendor system or activate an existing patient in the vendor system. The Care Coordinator selects the patient from the list of VistA registered patients and selects the Home Telehealth vendor server from the approved list. The VistA system obtains a national identifier, if one has not already been obtained. No patient can be registered with a Home Telehealth vendor server until the patient has a valid national identifier. The VistA system sends the sign up message to the appropriate Home Telehealth system. This process simplifies the sign up process for the care coordinator, decreases errors from manually entering data, improves data quality, and ensures that an accurate link is made between the patient record in VistA and the record in the Home Telehealth system. Critical requirements in the sign up message exchanges are the accurate transfer and storage of the name, date of birth, social security number, local VistA identifier (DFN), local system identifier (facility number), and VA's Integrated Control Number (ICN). The ICN is the enterprise patient identifier; it links the Home Telehealth patient data to other medical records stored within any other VHA medical system. When a sign up message is received for a patient that is already active in another facility, the message is not to be processed; the message is generate an error indication (sections 3.1.2.4 and 3.1.6). When a sign up message is received for a patient that is already active at requesting facility, the message is to be processed as a patient demographics update (section 3.4) or a change of the assigned care coordinator. When a patient is inactive, the sign up function is equivalent to an "activate" and resumes the generation and sending of progress notes (section 3.7) to VistA and the sending of Home Telehealth data to the HDR (section 3.2).

3.1.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; the following paragraphs list the responsibilities.

3.1.2.1 User Responsibilities

The user for this function is the care coordinator. The care coordinator enters the patient sign up request. The care coordinator uses a VistA menu to accomplish the patient sign-up. The care coordinator uses the menu to:

1. Select the patient.
2. Select the Home Telehealth vendor server that will service the patient.
3. Select the consult that is the basis for the assignment.
4. Select the care coordinator that manages the patient's care

After the selections have been made, the care coordinator will request that a sign up be sent to the Home Telehealth vendor system. VistA maintains a list of registered Home Telehealth patients.

3.1.2.2 VistA Responsibilities

If the patient does not have a national ICN, VistA will notify the user that a national ICN is required. VistA will then start the process to obtain a national ICN. A sign up request cannot be submitted without a national ICN. A sign up request cannot be submitted for an active patient. Once the user has completed the sign up request, VistA composes the HL7 sign up message and sends it through the Interface Engine to the appropriate Home Telehealth vendor server. VistA is also responsible for maintaining the status of the sign up request and processing the acknowledgement message. Once the Home Telehealth vendor server has accepted the request, the patient is set active in the VistA patient database. The vendor server indicates acceptance of the request by sending an HL7 application acknowledge (section 3.7.6).

3.1.2.3 Interface Engine Responsibilities

The Interface Engine routes the message from the facility Interface Engine through the Austin Interface Engine to the appropriate Home Telehealth vendor server. The Interface Engine routes Acknowledgement messages originating at the Home Telehealth vendor server to the originating facility.

3.1.2.4 Home Telehealth vendor server Responsibilities

The Home Telehealth vendor server accepts[1] and processes the Sign up message. The messages source (MSH-4) defines the facility that is requesting the sign up. The requesting facility is

[1] The acceptance of a message is indicated by the generation of a message acceptance HL7 message (commonly called a Commit ACK or a CA).

known as the sign up facility. All sign up messages for patients that are already active at a facility other than the sign up facility are to be rejected. Sign up messages for an active patient at the sign up facility are to be treated as an update for the patient demographics, a care coordinator or consult number change. The PID segment is used to update patient address and phone number. The PD1 and PV1 segments are used to update the care coordinator and consult number. The validation rules for the information defining the patient are given in section 3.1.3. The verification rules for the patient identity are given in section C.2. If the patient identity cannot be verified the request is to be rejected with an appropriate error code (see Table 79). If the vendor server accepts the sign up,

1. The server sends a "subscribe to patient identity and demographics update" message to the MPI server using the sign up VistA DFN.
2. The server receives an acceptance of the subscription from the MPI validating the VistA data[2] and the registration.
3. The server stores the patient's ICN, VistA DFN, SSN, first name, last name, and date of birth in the vendor server database.
4. The server stores the patient's address and phone number in the vendor server database, if the data is available in the request.[3]
5. The server sends a positive acknowledgement message to the originating VistA facility (the sign up facility).
6. The server enables the collection of data for the Summary of Episode progress note (section 3.7).

If the MPI rejects the subscription, the vendor server must reject the sign up request. If the MPI response is not consistent with the VistA sign up message, the vendor must reject the sign up request. If the sign up request would create an inconsistency in the vendor server database, the vendor server must reject the sign up request. If the vendor server rejects the sign up, the server must send a negative acknowledgement message to the originating VistA facility indicating the reason for rejection. Section 3.1.6 gives the reasons for rejection and error text.

The Home Telehealth vendor server uses a Subscribe to Patient Identity and Demographics Update function (section 3.3) to notify the MPI server that it needs patient identity and demographics updates (section 3.4).

3.1.2.5 MPI Responsibilities

[2] The verification is accomplished by comparing the standardized form of each name. The standardized form of a name is given in Appendix L.

[3] If the MPI response does not either contain an address or phone number for the patient, the VistA request should be used for the information.

The MPI will respond to the registration of the vendor server using the sign up VistA facility DFN. This will identify that the vendor server is collecting data for the patient. The function will initiate the subscription function described in section 3.3

3.1.2.6 HDR Responsibilities

HDR is not involved in the sign up process.

3.1.3 Required Data Items

The patient sign up process requires the following fundamental data items:

- Home Telehealth vendor server identification
- Patient ICN
- Patient Name
- Patient Date of Birth
- Patient SSN
- Patient home address
- Local home phone number
- Patient record number (DFN) created by the VistA facility
- Patient record VistA facility id
- Patient record VistA facility number
- Consult number that established the patient eligibility for Home Telehealth
- Care coordinator name as identified in VistA

Table 3 contains the location and use of the data items from the viewpoint of a Home Telehealth vendor server.

Table 3: Home Telehealth Vendor Server Sign Up Data Items

Data item	Use	Source
Home Telehealth vendor server identification	Placed in MSH and OBX segments to identify the vendor server and vendor server application	Table 80 and Table 81
Patient ICN	National index for the patient (unique identity within the VA), sent to the HDR (section 3.2)	PID-3 (Table 14 and Table 15)
Patient Name	Legal name of the patient, sent to the HDR (section 3.2)	PID-5 (Table 13)
Patient SSN	US index for the patient (unique identity within the US), sent to the	PID-3 (Table 14 and Table 15)

Data item	Use	Source
	HDR (section 3.2)	
Patient's home phone number[4]	Contact number for patient	PID-13 (Table 13)
Patient's home address	Location of the home equipment	PID-11 (Table 13)
Patient's record number in sign up VistA facility (DFN)	VistA facility index for the patient (unique identity within VistA facility), sent to the HDR (section 3.2) to identify the patient	PID-3 (Table 14 and Table 15)
Sign up facility number	Identify the source of sign up message and identification of source of indices and names	MSH-4 (Table 6) and various places in PID (Table 13), PD1, and PV1 segments
Sign up facility DNS	Identify the source of sign up message	MSH-4 (Table 6)
Sign up facility id	Identify the source of indices and names	Various locations in PID (Table 13), PD1 (Table 23), and PV1 (Table 25) segments
Patient DOB	Aid in the manual resolution of data integrity issues	PID-7 (Table 13)
Consult number	The basis of the Home Telehealth assignment, used to associate a progress note with Home Telehealth	PV1-5 (Table 25)
Care Coordinator name	Person that can modify the patient's data on the vendor server, valid CCOW user	PD1-4 (Table 23)
Date/Time of event	The official time stamp for the activation	EVN-2 (Table 12)

The vendor server will not accept a sign up request with an incomplete PID, PD1, or PV1 segment. A complete PID segment has an ICN, DFN, SSN, name and DOB. A complete PD1 has a care coordinator. A complete PV1 has a consult number. Table 4 contains the rules used to validate the data items contained in PID, PD1, and PV1 segments.

[4] The patient telephone number is an optional entity. If a phone number is available, it should be stored. Patient information should not be considered incomplete if a phone number is not available.

Table 4: Data Validation Rules[5]

Data item	Type	Length	Validation rule
ICN[6]	Mixed	17	10 digits (numeric) (actual MRN) "V" (case insensitive) 6 digits (numeric) (checksum)
DFN[7]	Numeric	18	18 digits (numeric)[8] (actual MRN)
SSN[9]	Mixed	9 or 10	9 digit (numeric) with optional "P" (case insensitive) denoting pseudo SSN
Name	Alphabetic	Varies	Last name (surname) is required. First and second names are optional[10]
Date of birth	Date string	8 or 19	yyyymmdd (defined in the HL7 2.4 standard) time component (if present) should be midnight (000000-0000)
Date/Time, Time, or Time Stamp	Date/time string	19	yyyymmddhhmmss-hhss (as defined in the HL7 2.4 standard)[11]

The validation of the content of the required data items depends upon the state of the patient in the vendor database. Legacy patients are identified by SSN. Integrated patients are identified by ICN. All patients are identified in an HL7 message by the ICN; any HL7 message that does not contain an ICN to identify the patient is to be rejected. If the identified patient is present in the

5 Section 4 defines the actual contents of the HL7 fields that define the values used by the Home Telehealth program.

6 This rule only pertains to the ID component of the ICN field.

7 This rule only pertains to the ID component of the DFN field.

8 While the DFN is a number, it is to be stored as a string since its actual length can exceed numeric values stored on some computer systems. All comparisons should ignore leading zeros or spaces. An individual instance of a DFN is a string of length less than or equal the size specified in the Table 4.

9 This rule only pertains to the ID component of the SSN field.

10 If the name is defined in an HL7 message, all components of the name should be stored and sent whenever the name is sent. If an existing name is received in an HL7 message, the non-null components should be checked for consistency; null name components should not be flagged as errors.

11 The HL7 uses ISO 8824-1987(E) to define the encoding of a time stamp (TS) field. All time stamps created by Home Telehealth vendors should contain all components of the time stamp (year, month, day, hours, minutes, seconds and UTC offset). A time stamp may contain fractional seconds (yyyymmddhhmmss.ssss-hhss). Home Telehealth vendors must accept time stamps with fractional seconds, but should not generate time stamps with fractional seconds. Home Telehealth vendors must accept time stamps in the ISO format (YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ]); for example a time stamp with just a year, month, and day would correspond to midnight on the day. If the time zone offset is not specified in a time stamp, the one specified in MSH-7 is used. At a minimum MSH-7 must specify a time zone.

vendor database, the patient name, SSN, DFN[12], and DOB are to be verified using the rules in Table 4; the DFN validation is to be done for only non-legacy patients. The HL7 standard defines that any comparison between components is a string comparison (see section 4). If one of the comparison terms is null, then the comparison is considered as valid; otherwise, standard string comparison rules apply. If the identified patient is not present in the vendor database, an MPI subscription is to be made (see section 3.3). The rules for the verification of patient identity are given in section C.2. A failed verification indicates that the vendor patient database is not coherent with the VA patient database and requires immediate attention by the support staff. The vendor patient entry must be placed in a coherent state before a patient can integrated.

3.1.4 Data Nomenclature

The VistA facility id and VistA facility number are obtained from the Institution File; other data comes from the VistA Patient file and the New Person file. The institution file definition and extract can be found on the section labeled *Facility address file* on the web page http://vaww.va.gov/techsvc/projects/VICReplacement_docs.html. A recent extract from the address file can be directly retrieved from URL http://vaww.va.gov/techsvc/projects/VIC/FacilityAddresses_Vendor.txt. .

3.1.5 Sign up Message Content

The *VA Home Telehealth HL-7 Message formats* document defines the message content details. The following is a high-level explanation of the fields of primary interest for Home Telehealth. The sign up function uses the Admission, Discharge, and Transfer (ADT) Message as documented in chapter 3 of the HL7 standard. The event code is A04 (Register a Patient). VistA sends the sign up message to initiate the sign up function on the Home Telehealth vendor server.

3.1.5.1 Sign up Message Format

The HL7 sign up message has five data segments that contain the following information: message identification (MSH), sign up event (EVN), patient identification (PID), additional demographic information for the patient (PD1), and patient visit information (PV1). Table 5 lists the segment in an ADT-A04 message. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

[12] The DFN should be treated as a tuple: local index and facility number. The index portion the DFN is only unique within the assigning facility. All comparisons between two DFNs must include both the index and the facility number. DFN_a and DFN_b are equal if and only if the ID component of DFN_a equals the ID component of DFN_b and the assigning facility of DFN_a equals the assigning facility of DFN_b.

Table 5: Home Telehealth ADT-A04 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
EVN	Event Type	Required	Time and date of sign up/activation
PID	Patient Identification	Required	Patient
ROL	Role	Optional	(not used by Home Telehealth)
PD1	Additional Demographics	Required	Home Telehealth care coordinator
NK1	Next of Kin	Optional	(not used by Home Telehealth)
PV1	Patient Visit	Optional	Home Telehealth consult number[13]
PV2	Patient Visit – Additional Information	Optional	(not used by Home Telehealth)
DB1	Disability Information	Optional	(not used by Home Telehealth)
OBX	Observation/Result	Optional	(not used by Home Telehealth)
AL1	Allergy Information	Optional	(not used by Home Telehealth)
DG1	Diagnosis Information	Optional	(not used by Home Telehealth)
DRG	Diagnosis Related Group	Optional	(not used by Home Telehealth)
PR1	Procedure	Optional	(not used by Home Telehealth)
GT1	Guarantor	Optional	(not used by Home Telehealth)
IN1	Insurance	Optional	(not used by Home Telehealth)
IN2	Insurance Additional Information	Optional	(not used by Home Telehealth)
IN3	Insurance Additional Information	Optional	(not used by Home Telehealth)
ACC	Accident Information	Optional	(not used by Home Telehealth)
UB1	Universal Bill Information	Optional	(not used by Home Telehealth)
UB2	Universal Bill 92 Information	Optional	(not used by Home Telehealth)
PDA	Patient Death and Autopsy	Optional	(not used by Home Telehealth)

The MSH segment is common to all HL7 messages; the information contained in this section is applicable to all HL7 messages used in the Home Telehealth program. Table 6 lists the MSH segment fields. The table is included here to give a simple definition of the VA specifics. The authoritative definitions of the fields are the *Health Level Seven Version 2.4* specification and the *VA HL7 Message Profile* document. The primary items of interest in the MSH segment are the identities of the Home Telehealth Vendor application and server, the VistA application and server, the message type, and the acknowledgement requirements. The tables in section 3.14 give the Home Telehealth vendor server information (see Table 80, Table 81, and Table 82).

[13] The linkage between a consult and the progress notes is being removed. If a sign up is received without a PV1 segment, a null value should be used.

The requesting system identifier is in the MSH-4 field (*Sending facility*). Table 7 gives the format of VA facility identifiers; all components of VA facility identifiers must be in upper case. MSH-7 contains the time stamp for the creation of the message. It should be created locally and not copied from a received message. The message type is in the MSH-9 field (*Message type*). The message type for the sign up message is **ADT~A04**. The Message Control ID is in the MSH-10 field (*Message Control ID*). The message control ID identifies the original message in an acknowledgment. The message acceptance requirement is in the MSH-15 field (*Accept Acknowledgement Type*). The application acceptance requirement type is in the MSH-16 field (*Application Acknowledgement Type*). Both fields use a value of "AL" (*always*) for messages generated by a Home Telehealth system.[14]

Table 6: VA MSH Segment

Field	Name	Type	Example	VA use or definition
MSH-1	Field separator	ST	^	Separates the segment fields
MSH-2	Encoding characters	ST	~|\&	Component repetition escape subcomponent
MSH-3	Sending application	HD[15]	DG HOME TELEHEALTH	(Table 81)
MSH-4	Sending facility	HD[16]	200M~<VistA dns>~DNS	Facility in DNS format (Table 7)
MSH-5	Receiving application	HD[17]	HTAPPL	(Table 81)
MSH-6	Receiving facility	HD[18]	200Tx~<vendor dns>~DNS	Facility in DNS format (Table 7)
MSH-7	Date/time of message[19]	TS	20020921133629-0500	(HL7 2.4 standard)
MSH-8	Security	ST		(the field is not supported)
MSH-9	Message type	CM	ADT~A04	(HL7 2.4 standard)
MSH-10	Message control	ST	500167099	The value must be unique

14 At the current time, the HDR will not respond to the request for an application acknowledgement.

15 The application name must be in upper case.

16 All components of the sending facility field must be in upper case.

17 The application name must be in upper case.

18 All components of the receiving facility field must be in upper case.

19 According to the HL7 2.4 standard, the UTC offset in MSH-7 is used for all time stamps in the message that do not contain a UTC offset; the UTC offset is the default for all time stamps in the message.

Field	Name	Type	Example	VA use or definition
	ID			by vendor server, but may be repeated after receipt of an application acknowledgement. The value must not be repeated.
MSH-11	Processing ID[20]	PT	P	(Table 10)
MSH-12	Version ID	VID	2.4	(HL7 2.4 standard – Home Telehealth supports only version 2.4)
MSH-13	Sequence number	NM		(the field is not supported)
MSH-14	Continuation pointer	ST		(the field is not supported)
MSH-15[21]	Accept acknowledgement type	ID	AL	(Table 11)
MSH-16[22]	Application acknowledgement type	ID	AL	(Table 11)
MSH-17	Country code	ID	USA[23]	(HL7 2.4 standard)
MSH-18	Character set	ID		(the field is not supported)
MSH-19	Principal language of message	CE		(the field is not supported)
MSH-20	Alternate character set handling scheme	ID		(the field is not supported)
MSH-21	Conformance statement ID	ID		(the field is not supported)

20 All traffic carrying production data must be labeled with a Processing ID of "P".

21 Every message received by a Home Telehealth vendor system must respond with an appropriate accept (message) acknowledgement as indicated by the contents of MSH-15. Home Telehealth vendor systems should always request a commit acknowledgement for all messages except a commit acknowledgement itself.

22 Every message received by a Home Telehealth vendor system must respond with an appropriate application acknowledgement as indicated by the contents of MSH-16. Home Telehealth vendor systems should always request an application acknowledgement for all messages except a commit acknowledgement or an application acknowledgment.

23 The Country Code field may be <null>; if so, the contents is assumed to be "USA".

Table 7: VA Facility Components – DNS Format (HL7 HD Data Type)

Component	Name	Type	Value
FACILITY-x.1	Namespace ID	IS	VA facility number[24]
FACILITY-x.2	Universal ID	ST	VA facility DNS name
FACILITY-x.3	Universal ID type	ID	DNS

Table 8: VA Facility Components – L Format (HL7 HD Data Type)

Component	Name	Type	Value
FACILITY-x.1	Namespace ID	IS	VA facility id[25]
FACILITY-x.2	Universal ID	ST	VA facility number
FACILITY-x.3	Universal ID type	ID	L

Table 9: VA Facility Numbers

Facility	Name	Mode	Number
HDR	Health Data Repository	Test	200H
MPI	Master Patient Index	Test	200M
VistA	VistA PIMS and TIU applications	Test	552
Census	Home Telehealth census database	Test	552
Survey	Home Telehealth survey database	Test	552
HDR	Health Data Repository	Production	200HD
MPI	Master Patient Index	Production	200M
VistA	VistA PIMS and TIU applications	Production	(received in activation message)
Census	Home Telehealth census database	Production	668HT
Survey	Home Telehealth survey database	Production	668HT

Table 10: Processing ID Requirements

Processing Type	Value	Processing
Debugging	D	The system is functional testing or debugging. This value should be used when testing with the OI emulator. A message carrying production traffic should never be labeled with a Processing ID.
Training	T	The system is being used for system testing or training. This value should be used in the ITL. A message carrying

[24] The facility numbers used by Home Telehealth are defined in Table 9. The facility number associated with individual patients is given in the MSH segment of the activation message of the patient; the same number will be repeated in the PID-4 field of the message as part of the DFN definition.

[25] The facility name in an HL7 message is a courtesy item; it is not authoritative. It may contain the string "VA FACILITY ID".

Processing Type	Value	Processing
		production traffic should never be labeled with a Processing ID of "T".
Production	P	The system is being used to support active patients. All messages carrying information on active patients must be labeled with a Processing ID of "P".

Table 11: Acknowledgement Type Requirements

Acknowledgement Type	Value	Processing
Always	AL	Acknowledgement must be generated. Message (accept) acknowledgment indicates the general acceptance or rejection of the message (commit acknowledgement). Application acknowledgement indicates the successful processing or processing failure of the message function.
Never	NE	No acknowledgement is to be generated.
Error/reject conditions only	ER[26]	Only errors are to be identified. If the message is accepted, no accept (message) acknowledgement is to be generated. If the message function completes successfully, no application acknowledgement is to be generated.
Successful completion only	SU[27]	Only successful processing is to be identified. If the message is not accepted, no accept (message) rejection or error is to be generated. If the message function cannot be completed, no application acknowledgement is to be sent indicating the failure.

The EVN segment is common segment for a number of HL7 messages; the information in this section defines the usage for all messages used by Home Telehealth that have an EVN segment. Table 12 defined the EVN fields as used for Home Telehealth. The event type code is derived from the MSH segment (MSH-9.2). The item of interest in the EVN segment is the *Recorded Date/Time* (EVN-2) which is the official date time for the request. All EVN segment built by a Home Telehealth vendor server should build the fields as defined in Table 12.

[26] The VA does not support the use of ER in either MSH-15 or MSH-16.

[27] The VA does not support the use of SU in either MSH-15 or MSH-16.

Table 12: VA EVN Segment

Field	Name	Type	Example	VA use or definition
EVN-1	Event Type Code	ID		(MSH-9.2)
EVN-2	Recorded Date/Time	TS	20111103134117-0500	Date and time of the event
EVN-3	Date/Time Planned Event	TS		(the field is not supported)
EVN-4	Event Reason Code	IS		
EVN-5	Operator ID	XCN		
EVN-6	Event Occurred	TS		
EVN-7	Event Facility	HD		Facility number

The PID segment fields are given in Table 13. The table is included here to give a simple definition of the VA specifics. The authoritative definitions of the fields are the *Health Level Seven Version 2.4* specification and the *VA HL7 Message Profile* document. The PID data segment contains the patient identifiers (ICN, DFN, and SSN) patient name, patient record facility number, and telephone number. The patient identifier The ICN and SSN are in PID-3 (*Patient Identifier List*). The VA uses the ICN as the HL7 national identifier (NI). The format of the patient VistA system record number (DFN), ICN, and SSN is given in Table 14. Examples of each identifier are given in Table 16. The fields identified in Table 13 as "no requirement" must be stored and placed in each PID sent by the vendor server; the fields may be null. The HL7 standard identifies that a null field is never intended to overlay (or replace) a stored value. A null field indicates that data collected from a prior message is still current. Those fields identified as "not supported" do not need to be stored for processing; but the data values need to be placed in PIDs sent by the vendor server.

Table 13: VA PID Segment

Field	Name	Type	Home Telehealth requirement	VA use or definition
PID-1	Set ID	SI	(as appropriate – optional for single PID message, required for multiple PID message)	(HL7 2.4 standard)
PID-2	Patient ID	CX		(the field is not supported)
PID-3	Patient Identifier List	CX	The ICN, SSN, and DFN must be stored and used as a search key	(Table 14, Table 15, and Table 16)
PID-4	Alternate Patient ID	CX		(the field is not supported)
PID-5	Patient Name	XPN	The name must be stored and used as a search key – Home Telehealth requires the first and last name. Home Telehealth uses only the legal name.	Table 17
PID-6	Mother's maiden name	XPN	Home Telehealth requires the last name only...Home Telehealth uses only the legal name.	Table 17

Field	Name	Type	Home Telehealth requirement	VA use or definition
PID-7	Date/time of birth	TS	The DOB must be stored	(HL7 2.4 standard)
PID-8	Administrative sex	IS	(no requirement)	(HL7 2.4 standard)
PID-9	Patient alias	XPN		(the field is not supported)
PID-10	Race	CE	(no requirement)	VA table 0005
PID-11	Patient address	XAD	The address must be stored[28]	Table 18
PID-12	County code	IS		(the field is not supported)
PID-13	Phone number – home	XTN	The phone number must be stored[29]	(HL7 2.4 standard)
PID-14	Phone number – business	XTN	(no requirement)	(HL7 2.4 standard)
PID-15	Primary language	CE		(the field is not supported)
PID-16	Marital status	CE	(no requirement)	VA table 0002
PID-17	Religion	CE	(no requirement)	VA table 0006
PID-18	Patient account number	CX		(the field is not supported)
PID-19	SSN number – patient	ST		(the field is not supported)
PID-20	Driver's license number – patient	DLN		(the field is not supported)
PID-21	Mother's identifier	CX		(the field is not supported)
PID-22	Ethnic group	CE	(no requirement)	(HL7 2.4 standard)
PID-23	Birth place	ST		(the field is not supported)
PID-24	Multiple birth	ID		(the field is not supported)

[28] The patient address is an optional entity. If an address is available, it should be stored. Patient information should not be considered incomplete if an address is not available. The form of the patient address is described below (see Table 18).

[29] The patient telephone number is an optional entity. If a phone number is available, it should be stored. Patient information should not be considered incomplete if a phone number is not available. The form of the telephone number is described below (see Table 20).

Field	Name	Type	Home Telehealth requirement	VA use or definition
	indicator			
PID-25	Birth order	NM		(the field is not supported)
PID-26	Citizenship	CE		(the field is not supported)
PID-27	Veterans military status	CE	(no requirement)	(HL7 2.4 standard)
PID-28	Nationality	CE		(the field is not supported)
PID-29	Patient death date and time	TS	(no requirement)	(HL7 2.4 standard)
PID-30	Patient death indicator	ID	(no requirement)	(HL7 2.4 standard)
PID-31	Identity unknown indicator	ID		(the field is not supported)
PID-32	Identity reliability code	IS		(the field is not supported)
PID-33	Last update date/time	TS		(the field is not supported)
PID-34	Last update facility	HD		(the field is not supported)
PID-35	Species code	CE		(the field is not supported)
PID-36	Breed code	CE		(the field is not supported)
PID-37	Strain	ST		(the field is not supported)
PID-38	Production class code	CE		(the field is not supported)

Table 14: VA Patient Identifier (HL7 CX Data Type)

Component	Name	Type	Value
ID-x.1	ID	ST	
ID-x.2	Check digit	ST	(the component is not supported)
ID-x.3	Check digit algorithm	ID	(the component is not supported)
ID-x.4	Assigning Authority	HD	(see following)
ID-x.4.1	Namespace id	IS	USVHA – ICN,DFN USSSA – SSN USVBA – claim number
ID-x.4.2	Universal id	ST	(the component is not supported)
ID-x.4.3	Universal id type	ID	363 – VA table that defined namespace id (ID-x.4.1)
ID-x.5	Identifier type code	ID	NI – ICN (national identifier) SS – SSN PI – DFN (patient identifier)

Component	Name	Type	Value
			PN – claim number
ID-x.6	Assigning facility	HD	Facility in L format (Table 8)
ID-x.7	Effective date	DT	(the component is not supported)
ID-x.8	Expiration date	DT	(Home Telehealth does not support identifiers with expiration dates)

Table 15: VA Patient Identifier Component Values

Identifier	Assigning Authority	Identifier type	Assigning Location	Expiration date
National ICN	USVHA	NI	VA facility number[30]	
Local ICN (temporary use only)[31]	USVHA	NI	VA facility number (first three digits of ICN are facility number)	Replacement date/time
SSN	USSSA	SS	VA facility number	
VA facility id (DFN)	USVHA	PI	VA facility number	
Claim number[32]	USVBA	PN	VA facility number	

Table 16: VA Patient Identifier Exemples

Identifier	Example
DFN	123456789~~~USVHA&&0363~PI~<VA facility name>&<VA facility number>&L
ICN	1234567890V587816~~~USVHA&&0363~NI~<VA facility name>&<VA facility number>&L
SSN	123456789~~~USSSA&&0363~SS~<VA facility name>&<VA facility number>&L

Table 17: VA Definition for HL7 XPN Field Components (Name)

Component	Subcomponent	Identifier type	Length	Requirement
Family Name		FN		
	Surname	ST	35	(required)
	Own surname prefix	ST		(not supported)
	Own surname	ST		(not supported)

[30] The assigning facility

[31] A local ICN is not to be stored or used by a Home Telehealth vendor server.

[32] A claim number is not to be stored or used by a Home Telehealth vendor server.

Component	Subcomponent	Identifier type	Length	Requirement
	Surname prefix from partner/spouse	ST		(not supported)
	Surname from partner/spouse	ST		(not supported)
Given name		ST	30	(optional)[33]
Second and further given names or initials thereof		ST	30	(optional)[34]
Suffix		ST	3	(optional)[35]
Prefix		ST	3	(not supported)
Degree		ST	3	(not supported)
Name type code		ID	3	(required) HL7 Table 0200[36]
Name representation code		ID		(not supported)
Name context		CE		(not supported)
Name validity range		DR		(not supported)
Name assembly order		ID		(not supported)

Table 18: VA Definition for HL7 XAD Field Components (Address)

Component	Subcomponent	Identifier type	Length	Requirement
Street address		SAD		
	Street or mailing address	ST	255	(required)
	Street name	ST		(not supported)
	Dwelling number	ST		(not supported)
Other		ST	30	(optional)[37]

33 A patient may have no first name, or just have a first initial.

34 The program supports only one middle name; an initial may be used in lieu of a middle name. A patient may no middle name, or just middle initial.

35 The suffix may be required to further qualify the individual's name.

36 The program supports the *Legal Name* for a patient; name type code "L". Names of other types should be ignored and the contents should not be validated.

37 A second address line may be null (not present) in an address.

Component	Subcomponent	Identifier type	Length	Requirement
designation				
City		ST	30	(required)
State or province		ST	10[38]	(required)
Zip or postal Code		ST	xxxxx-xxxx[39]	(required)
Country		ID	ISO 3166 (HL7 uses the 3 letter form)	(optional)[40]
Address type		ID	3	(Table 19)[41]
Other geographic designation		ST		(not supported)
County/parish code		IS		(not supported)
Census tract		OS	3	(not supported)
Address representation code		ID		(not supported)
Address validity range		DR		(not supported)

Table 19: HL7 Address Type (ID)

Value	Description
BA	Bad address
N	Birth (nee) (birth address, not otherwise specified)
BDL	Birth delivery location (address where birth occurred)
F	Country Of Origin
C	Current Or Temporary

38 The program uses the postal abbreviates for states (2 letters).

39 The ZIP code can be either the 5 or 5+4 form.

40 If not specified, *USA* is assumed.

41 The program requires that only one address be stored. The address types are defined in HL7 table 190; the preferred address is the *permanent address* (address type "P"). Address of other types should be ignored. The contents should not be validated.

Value	Description
B	Firm/Business
H	Home
L	Legal Address
M	Mailing
O	Office
P	Permanent
RH	Registry home. Refers to the information system, typically managed by a public health agency that stores patient information such as immunization histories or cancer data, regardless of where the patient obtains services.
BR	Residence at birth (home address at time of birth)

The patient name is in the PID-5 field (*Patient Name*). The format of the patient name is **Family name~Given name~Second name~suffix~prefix~degree~L**. Home Telehealth will only use legal names; in the above example the seventh component ("L") identifies the name type; "L" indicates a legal name (please refer to the HL7 2.4 standard XPN data format). The only required name is the "family name" since the VA has patients without a first or middle name. The format of VA names is defined in Table 17. The format of VA address is defined in Table 18. The only supported address is a "permanent address" (see Table 18). The patient's telephone number is in the PID-13 field. The format of the telephone number is **(xxx)xxx-xxxx** as defined in the HL7 2.4 standard (see Table 20). The PID-13 field may be repeated, but only the Primary Residence Number (see Table 21) for a telephone (see Table 22) is to be stored. All other components of PID-13 are to be ignored.

Table 20: VA Definition for HL7 XTN Field Components (Phone Number)

Component	Subcomponent	Identifier type	Length	Requirement
Telephone Number		TN	(000)000-0000[42]	Residence number must be stored
Telecommunication use code		ID	(see Table 21)	PRN identifies the primary residence number
Telecommunication equipment type		ID	(see Table 22)	PH identifies telephone

[42] The TN data type in the HL7 standard is [NN] [(999)]999-9999[X99999][B99999][C any text]; the VA only uses the form (999)999-9999.

Component	Subcomponent	Identifier type	Length	Requirement
Email address		ST		(not used)
Country Code		NM		(not used)
Area/city Code		NM		(not used)
Phone Number		NM		(not used)
Extension		NM		(not used)
Any Text		ST		(not used)

Table 21: HL7 Telecommunication Use Code (ID)

Value	Description
PRN	Primary Residence Number
ORN	Other Residence Number
WPN	Work Number
VHN	Vacation Home Number
ASN	Answering Service Number
EMR	Emergency Number
NET	Network (email) Address
BPN	Beeper Number

Table 22: HL7 Telecommunication Equipment Type (ID)

Value	Description
PH	Telephone
FX	Fax
MD	Modem
CP	Cellular Phone
BP	Beeper
Internet	Internet Address: Use Only If Telecommunication Use Code Is NET
X.400	X.400 email address: Use Only If Telecommunication Use Code Is NET

The items of interest in the PD1 data segment are the authoritative source of the patient demographics information, and care coordinator. The facility information is in the field PD1-3 (*Patient Primary Facility*). The format of the facility information is **organization name** from the institution file. The format of the organization name is **Facility Id~~Facility Number**, i.e.**Detroit~~553**. The VistA primary Care Coordinator information is given in the field PD1-4 (*Patient Primary Care Provider Name & ID No.*) The format of the care coordinator

information is defined in Table 24. This information should be linked to the primary Care Coordinator in the vendor system (see section 3.1).

Table 23: VA PD1 Segment

Field	Name	Type	Home Telehealth requirement	VA use or definition
PD1-1	Living Dependency	IS		(the field is not supported)
PD1-2	Living Arrangement	IS		(the field is not supported)
PD1-3	Patient Primary Facility	XON	(no requirement)[43]	(HL7 2.4 standard)
PD1-4	Patient Primary Care Provider Name & ID No.	XCN	Care Coordinator	Table 24
PD1-5	Student Indicator	IS		(the field is not supported)
PD1-6	Handicap	IS		(the field is not supported)
PD1-7	Living Will Code	IS		(the field is not supported)
PD1-8	Organ Donor Code	IS		(the field is not supported)
PD1-9	Separate Bill	ID		(the field is not supported)
PD1-10	Duplicate Patient	CX		(the field is not supported)
PD1-11	Publicity Code	CE		(the field is not supported)
PD1-12	Production Indicator	ID		(the field is not supported)
PD1-13	Protection Indicator Effective Date	DT		(the field is not supported)
PD1-14	Place of Worship	XON		(the field is not supported)
PD1-15	Advance Directive Code	CE		(the field is not supported)
PD1-16	Immunization Registry Status	IS		(the field is not supported)
PD1-17	Immunization Registry Status Effective Date	DT		(the field is not supported)
PD1-18	Publicity Code Effective Date	DT		(the field is not supported)
PD1-19	Military Branch	IS		(the field is not supported)
PD1-20	Military Rank/Grade	IS		(the field is not supported)
PD1-21	Military Status	IS		(the field is not supported)

[43] The true assigning facility is contained in PV1-39 (Servicing Facility)

Table 24: VA Definition for HL7 XCN Field Components

Component	Subcomponent	Identifier type	Length	Requirement
ID number		ST	5	(required)
Family Name		FN		
	Surname	ST	35	(required)
	Own surname prefix	ST		(not supported)
	Own surname	ST		(not supported)
	Surname prefix from partner/spouse	ST		(not supported)
	Surname from partner/spouse	ST		(not supported)
Given name		ST	30	(optional)[44]
Second and further given names or initials thereof		ST	30	(optional)[45]
Suffix		ST	3	(not supported)
Prefix		ST	3	(not supported)
Degree		ST	3	(not supported)
Source table		IS	3	(not supported)
Name type code		ID	3	(required) HL7 Table 0200[46]
Name representation code		ID		(not supported)
Name context		CE		(not supported)
Name validity range		DR		(not supported)
Name		ID		(not supported)

[44] A patient may have no first name, or just have a first initial.

[45] The program supports only one middle name; an initial may be used in lieu of a middle name. A patient may no middle name, or just middle initial.

[46] The program supports the *Legal Name* for a patient; name type code "L".

Component	Subcomponent	Identifier type	Length	Requirement
assembly order				

The item of interest in the PV1 data segment is the consult number that was used to qualify the patient for Home Telehealth. Table 25 defines the PV1 segment as used by Home Telehealth. The consult number is in the field PV1-5 (*Preadmit Number*). The format of the consult number is similar to a patient identifier as defined in Table 14; an example of the consult number is 123456789~~~USVHA&&0363~~<VA facility name>&<VA facility number>&L.

Table 25: VA PV1 Segment

Field	Name	Type	Home Telehealth requirement	VA use or definition
PV1-1	Set ID	SI	(as appropriate – optional for single PV1 message, required for multiple PV1 message)	(HL7 2.4 standard)
PV1-2	Patient Class	IS	(no requirement)	(HL7 2.4 standard)
PV1-3	Assigned Patient Location	PL	(used to specify Home Telehealth clinic for messages to VistA)	Table 26
PV1-4	Admission Type	IS	(no requirement)	(HL7 2.4 standard)
PV1-5	Preadmit Number	CX	Consult number[47]	Table 27
PV1-6	Prior Patient Location	PL	(no requirement)	(HL7 2.4 standard)
PV1-7	Attending Doctor	XCN	(no requirement)	(HL7 2.4 standard)
PV1-8	Referring Doctor	XCN		(the field is not supported)
PV1-9	Consulting Doctor	XCN		(the field is not supported)
PV1-10	Hospital Service	IS	(no requirement)	(HL7 2.4 standard)
PV1-11	Temporary Location	PL		(the field is not supported)
PV1-12	Preadmit	IS		(the field is not supported)

[47] The ID component of the PV1-5 field contains the consult number; the rest of the field can be ignored.

Field	Name	Type	Home Telehealth requirement	VA use or definition
	Test Indicator			
PV1-13	Re-admission Indicator	IS		(the field is not supported)
PV1-14	Admit Source	IS		(the field is not supported)
PV1-15	Ambulatory Status	IS		(the field is not supported)
PV1-16	VIP Indicator	IS		(the field is not supported)
PV1-17	Admitting Doctor	XCN		(the field is not supported)
PV1-18	Patient Type	IS	(no requirement)	(HL7 2.4 standard)
PV1-19	Visit Number	CX	(used to specify new visit for Home Telehealth clinic specified in PV1-3 for messages to VistA)	NEW[48]
PV1-20	Financial Class	FC		(the field is not supported)
PV1-21	Charge Price Indicator	IS	(no requirement)	(HL7 2.4 standard)
PV1-22	Courtesy Code	IS		(the field is not supported)
PV1-23	Credit Rating	IS		(the field is not supported)
PV1-24	Contract Code	IS		(the field is not supported)
PV1-25	Contract Effective Date	DT		(the field is not supported)
PV1-26	Contract Amount	NM		(the field is not supported)
PV1-27	Contract	NM		(the field is not supported)

[48] The contents of PV1-19 must be the string "NEW" for all progress notes so that a new visit will be created and linked to the progress note.

Field	Name	Type	Home Telehealth requirement	VA use or definition
	Period			
PV1-28	Interest Code	IS		(the field is not supported)
PV1-29	Transfer to Bad Debt Code	IS		(the field is not supported)
PV1-30	Transfer to Bad Debt Date	DT		(the field is not supported)
PV1-31	Bad Debt Agency Code	IS		(the field is not supported)
PV1-32	Bad Debt Transfer Amount	NM		(the field is not supported)
PV1-33	Bad Debt Recovery Amount	NM		(the field is not supported)
PV1-34	Delete Account Indicator	IS		(the field is not supported)
PV1-35	Delete Account Date	DT		(the field is not supported)
PV1-36	Discharge Disposition	IS		(the field is not supported)
PV1-37	Discharged to Location	CM_ DLD		(the field is not supported)
PV1-38	Diet Type	CE		(the field is not supported)
PV1-39	Servicing Facility	IS	(basis for vendor patient facility associations – see Appendix D)[49]	(HL7 2.4 standard)
PV1-40	Bed Status	IS		(the field is not supported)
PV1-41	Account	IS		(the field is not supported)

[49] Patient/facility associations can be used by a vendor for the assignment of a patient within a vendor's database. Within the VA all patients are associated with the facility specified in MSH-4.1. All messages sent by the vendor must use VA defined association (MSH-4.1 and PID). Within the vendor system the patient may be associated with the Servicing Facility (PV1-39). If PV1-39 is null, MSH-4.1 should be used.

Field	Name	Type	Home Telehealth requirement	VA use or definition
	Status			
PV1-42	Pending Location	PL		(the field is not supported)
PV1-43	Prior Temporary Location	PL		(the field is not supported)
PV1-44	Admit Date/Time	TS	(must be <null>)[50]	(HL7 2.4 standard)
PV1-45	Discharge Date/Time	TS	(must be <null>)[51]	(HL7 2.4 standard)
PV1-46	Current Patient Balance	NM		(the field is not supported)
PV1-47	Total Charges	NM		(the field is not supported)
PV1-48	Total Adjustments	NM		(the field is not supported)
PV1-49	Total Payments	NM		(the field is not supported)
PV1-50	Alternate Visit ID	CS		(the field is not supported)
PV1-51	Visit Indicator	IS		(the field is not supported)
PV1-52	Other HealthCare Provider	XCN		(the field is not supported)

Table 26: VA Clinic Name in PV1-3 (HL7 PL Data Type)

Component	Name	Type	Value
PV1-3.1	Point of care	IS	Clinic Name (Table 92)
PV1-3.2	Room	IS	(the component is not supported)
PV1-3.3	Bed	IS	(the component is not supported)
PV1-3.4	Facility	HD	(the component is not supported)
PV1-3.5	Location status	IS	(the component is not supported)
PV1-3.6	Person location type	IS	C

[50] This field must be <null> in a MDM-T02 transaction that defines a progress note.

[51] This field must be <null> in a MDM-T02 transaction that defines a progress note.

Component	Name	Type	Value
PV1-3.7	Building	IS	(the component is not supported)
PV1-3.8	Floor	IS	(the component is not supported)

Table 27: VA Consult Identifier in PV1-5 (HL7 CX Data Type)

Component	Name	Type	Value
PV1-5.1	ID	ST	Consult number[52]
PV1-5.2	Check digit	ST	(the component is not supported)
PV1-5.3	Check digit algorithm	ID	(the component is not supported)
PV1-5.4	Assigning Authority	HD	(see following)
PV1-5.4.1	Namespace id	IS	USVHA
PV1-5.4.2	Universal id	ST	(the component is not supported)
PV1-5.4.3	Universal id type	ID	(the component is not supported)
PV1-5.5	Identifier type code	ID	(the component is not supported)
PV1-5.6	Assigning facility	HD	(the component is not supported)
PV1-5.7	Effective date	DT	(the component is not supported)
PV1-5.8	Expiration date	DT	(Home Telehealth does not support identifiers with expiration dates)

3.1.5.2 Example

The following example contains five segments. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^) and
- field components are separated by a "tilde" (~).

Variable entities are enclosed in "<" and ">"; the actual value is chosen from a table associated with the variable. The sign up message has many fields that are not of interest to the Home Telehealth vendor server. The fields that are not of interest should be skipped and not processed. The example was created by the Home Telehealth emulator.

[52] The linkage of a progress note to a consult is being removed. The consult number may be blank (null). A null value is valid and can be used in the progress note transaction messages to indicate that no consult number was supplied.

```
MSH^~|\&^DG HOME TELEHEALTH^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^HTAPPL^200TX~XYZ.MED.VA.GOV~DNS^2
0051022154337-0500^^ADT~A04^120051022154337^T^2.4^^^AL^AL^USA^^^^

EVN^A04^20051022154337-0500^^2^32885~Blankenship~George~~~~~~USVHA&&0363~L~~~NI~FACILITY&STATION&L^200510221
54337-0500^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789
~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East We
st Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^

PD1^^^^33250~Doctor~Fine~~~~~~USVHA~L~~~NI~facility&station&L^^^^^^^^^^^^^^^^^

PV1^^^^^123456789~~~USVHA~~DAYTDEV&552&L~~^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
```

Figure 3: Sign up Request Message

3.1.6 Acknowledge Message Content

The message content is given in the *VA Home Telehealth HL-7 Message formats* document and in section 3.12. The Home Telehealth vendor server generates a commit acknowledgement upon receipt of the message, if the MSH segment indicates that one is required. The Home Telehealth vendor server generates an application acknowledgment message when it has processed the patient sign up message, if the MSH segment indicates that one is required. The acknowledgment message is common for all functions; this section gives general guidance with specific directions for the application acknowledgment given in section 3.9.

A commit acknowledgement is to be returned for every message that requests one. The commit acknowledgement should be returned promptly. Unless the message is malformed such that the type cannot be identified or the message cannot be queued for processing, the message should be accepted; otherwise, the message can be rejected. If possible the message should be accepted and an application acknowledgment (rejection or error) be used to indicate that the message could not be processed.

The Home Telehealth vendor server indicates the acceptance of the patient sign up request in the application acknowledgement. An application reject message will be sent for any of the conditions listed in Table 79. In general, the sign up will be rejected for the following four reasons

1. The PID segment contains invalid data.
2. Acceptance of the sign up would create inconsistencies in the vendor database.
3. The MPI subscription response indicates inconsistencies in the VA national database.
4. The MPI response is inconsistent with the sign up request.

3.1.6.1 Message Format

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard and section 3.12.5. The requirement for an acknowledgement is defined in the sign up message (section 3.1.5). The sign up will mandate an acceptance of the sign up itself (an application acknowledgement).

3.1.6.2 Example

The following examples are of a message acceptance, a request acceptance (application acknowledge) and a request refusal (application negative acknowledgement). Since the application acknowledge included a request for a commit acknowledgement, the commit acknowledgement is included. The examples were created by the Home Telehealth emulator.

```
MSH^~|\&^HTAPPL^200TX~XYZ.MED.VA.GOV~DNS^DG HOME TELEHEALTH^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^2
0051022154337-0500^^ACK~A04^120051022154337^T^2.4^^^ER^NE^USA^^^^

MSA^CA^120051022154337^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 4: Sign up Message Acceptance (Commit acknowledgement)

```
MSH^~|\&^HTAPPL^200TX~XYZ.MED.VA.GOV~DNS^DG HOME TELEHEALTH^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^2
0051022154337-0500^^ACK~A04^220051022154337^T^2.4^^^AL^NE^USA^^^^

MSA^AA^120051022154337^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 5: Sign up Request Acceptance (Application Acknowledge)

```
MSH^~|\&^DG HOME TELEHEALTH^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^HTAPPL^200TX~XYZ.MED.VA.GOV~DNS^2
0051022154338-0500^^ACK~A04^220051022154338^T^2.4^^^ER^NE^USA^^^^

MSA^CA^220051022154337^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 6: Application Acknowledge Message Acceptance (Commit acknowledgement)

```
MSH^~|\&^HTAPPL^200TX~XYZ.MED.VA.GOV~DNS^DG HOME TELEHEALTH^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^2
0051022154337-0500^^ACK~A04^220051022154337^T^2.4^^^AL^NE^USA^^^^

MSA^AR^120051022154337^^^^100~Missing ICN~HL70357

ERR^PID~3~0~100&Missing ICN&HL70357
```

Figure 7: Sign up Request Refusal (Application Acknowledge)

3.2 Observations

The Observation function sends the vital sign observations from the Home Telehealth vendor server to the Health Data Repository (HDR). The vital sign observation reporting is a priority one function.

3.2.1 Description

The data in the observation HL7 message contains the vitals observations for a patient under Home Telehealth care. The Home Telehealth vendor server collects the vitals observations from each home device and sends the observations to HDR. HDR will acknowledge the storage of the observations with an HL7 acknowledgement.

The observation process starts at the patient's home with the entering of data on the home device. If the home device allows for the manual entry (or self-entry) of data observations, the

observations that are self-entered must be identified in the observation report. The home device forwards the observation report to the Home Telehealth vendor server. The Home Telehealth vendor server forwards the observations and creates appropriate progress notes to convey any alarms (observations that are out-of-bounds). The creation of a progress note is a priority two effort.

The program has the notion of a data collection session modeled after an office visit. All data collected during a contiguous period should have the same time tag in OBR-7 (Table 35). Observation values with the same time tag will be presented to the clinical team as a cluster set. A cluster set is analogous to an office visit. The time tag for an observation set should be the time of the first observation of the set.

3.2.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; they are listed in sequential order.

3.2.2.1 User Responsibilities

The patient is the user in the observation process. The user performs the necessary actions on the home device to collect the observations that home device will send to the Home Telehealth vendor server and the necessary actions to initiate the transfer of the observations. The transfer from the Home Telehealth home device to the vendor server can be accomplished with proprietary protocols; there are no HL7 requirements on the transfer of data between the home device and the vendor server.

3.2.2.2 Home Telehealth vendor server Responsibilities

Once the home device has transferred a data collection to the associated Home Telehealth vendor server, the server composes the HL7 observation message and sends it through the Interface Engine to HDR. The server is also responsible maintaining the status of the observation transfer and processing the acknowledgement message. The vendor server must evaluate the submission's compliance with the Home Telehealth Date/Time Business rules; the location of the appropriate docuements can be found in section 8.6. Submissions that comply with the business rules must be sent to the HDR. Those that do not comply should be sent to the HDR flaged as entered in error (see Table 38) with an appropriate error qualifier (Table 39).

3.2.2.3 Interface Engine Responsibilities

The Interface Engine routes the message from the Home Telehealth vendor server to HDR. The Interface Engine routes Acknowledgement messages originating at HDR to the originating Home Telehealth vendor server.

3.2.2.4 HDR Responsibilities

HDR accepts the observation message and stores the observation. After processing the observation, HDR sends an acknowledgement message to the Home Telehealth vendor server. HDR must acknowledge each observation message indicating the acceptance and storing of the observation. The acknowledgement message would also be sent to indicate the rejection of an observation; in that case, the acknowledge message would contain an error indication and reason for rejection. The HDR will acknowledge the storage of observation messages with an application acknowledgement message, if one is requested. All observation messages sent to the HDR are to request application acknowledgement in MSH-16.

3.2.2.5 MPI Responsibilities

MPI is not involved in the observation process.

3.2.2.6 VistA Responsibilities

VistA is not involved in the observation process.

3.2.3 HT Mandatory Fields

The observation report contains the following fundamental data items:

- Sending device
- Patient record number (DFN)
- Patient record facility number
- Patient ICN
- Type of vital sign, date/time of observation, identifier, observation value, and source of the observation

Table 28: Home Telehealth Vendor Server Observation Data Items

Data item	Use	Source
Home Telehealth vendor server identification	Placed in MSH and OBX segments to identify the vendor server and vendor server application	Table 80 and Table 81
Patient ICN	National index for the patient (unique identity within the VA), sent to the HDR (section 3.2)	PID-3 (Table 14 and Table 15)
Patient Name	Legal name of the patient, sent to the HDR (section 3.2)	PID-5 (Table 13)
Patient SSN	US index for the patient (unique identity within the US), sent to the HDR (section 3.2)	PID-3 (Table 14 and Table 15)
Patient's local	Contact number for patient	PID-13 (Table 13)

Data item	Use	Source
phone number		
Patient's record number in sign up VistA facility (DFN)	VistA facility index for the patient (unique identity within VistA facility), sent to the HDR (section 3.2) to identify the patient	PID-3 (Table 14 and Table 15)
Sign up facility number	Identify the source of sign up message and identification of source of indices and names	MSH-4 (Table 6) and various places in PID (Table 13), PD1, and PV1 segments
Sign up facility DNS	Identify the source of sign up message	MSH-4 (Table 6)
Sign up facility id	Identify the source of indices and names	Various locations in PID (Table 13), PD1 (Table 23), and PV1 (Table 25) segments
Patient DOB	Aid in the manual resolution of data integrity issues	PID-7 (Table 13)
Consult number	The basis of the Home Telehealth assignment, used to associate a progress note with Home Telehealth	PV1-5 (Table 25)
Care Coordinator name	Person that can modify the patient's data on the vendor server, valid CCOW user	PD1-4 (Table 23)

3.2.4 Data Nomenclature

Section 5 contains the vitals types and unit types.

3.2.5 Observation Message Content

The message content is given in the *VA Home Telehealth HL-7 Message formats* document and the *VA HDR Vitals Message Profile* document.

3.2.5.1 Message Format

The observation function uses the Unsolicited Observation (ORU) Message as documented in chapter 7 of the HL7 standard. The event code is R01. The HL7 observation message has six data segments that contain the following information: message identification (MSH), patient identification (PID), order control (ORC), observation request (OBR), observation/result (ORX), and clinic stop code (ZSC). The message allows for a variable number of data segments; the message can carry data for multiple vital sign observations. The HDR supports only one observation per message; each vital sign must be in its own message. Table 29 lists the segment

in an ORU-R01 message. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 29: Home Telehealth ORU-R01 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
PID	Patient Identification	Required	Patient
ROL	Role	Optional	(not used by Home Telehealth)
PD1	Additional Demographics	Required	Home Telehealth care coordinator
NK1	Next of Kin	Optional	(not used by Home Telehealth)
NTE	Notes and Comments	Optional	(not used by Home Telehealth)
PV1	Patient Visit	Required	Home Telehealth consult number
PV2	Patient Visit – Additional Information	Optional	(not used by Home Telehealth)
ORC	Order common	Required	Identification of the collection order
OBR	Observations Report ID	Required	Identification of the observation set
CTD	Contact Data	Optional	(not used by Home Telehealth)
OBX	Observation/Result	Required	Data collected from home device
FT1	Financial Transaction	Optional	(not used by Home Telehealth)
CTI	Clinical Trial Identification	Optional	(not used by Home Telehealth)
DSC	Continuation Pointer	Optional	(not used by Home Telehealth)

The primary items of interest in the MSH segment (Table 6) are the identities of the Home Telehealth Vendor application/server, the HDR application/server, the message type, and the acknowledgement requirements. The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages.

The items of interest in the PID data segment (Table 13) are the patient VA identity (record number or key in a VA system database), patient identity facility identification (system that hosts the patients demographics database), and the ICN identifying the patient. The VA sign up facility identity (DFN), and the VA national identity (ICN), the US national identity (SSN) for the patient are given to the Home Telehealth vendor server in the patient sign up request (section 3.1).

The common order (ORC) segment identifies the medical order. The information for the common order is given in Table 30.

Table 30: VA ORC Segment

Field	Name	Type	Example	VA use or definition
ORC-1	Order Control	ID	RE	Observations-to-follow (fixed value)
ORC-2	Placer Order Number	EI		(the field is not supported)
ORC-3	Filler Order	EI	001200412081605-	Table 31

Field	Name	Type	Example	VA use or definition
	Number		0500~Telehealth XYZ Corp	
ORC-4	Placer Group-Number	EI		(the field is not supported)
ORC-5	Order Status	ID	CM	Order is completed (fixed value)
ORC-6	Response Flag	ID		(the field is not supported)
ORC-7	Quantity/Timing	TQ		(the field is not supported)
ORC-8	Parent	CM		(the field is not supported)
ORC-9	Date/Time of Transaction	TS		Current date/time
ORC-10	Entered By	XCN		(the field is not supported)
ORC-11	Verified By	XCN		(the field is not supported)
ORC-12	Ordering Provider	XCN		(the field is not supported)
ORC-13	Enterer's Location	PL	HT~~~~~~~~Telehealth XYZ Corp	Identifies that data was collected by Home Telehealth vendor (The Filler *Order Number* fields of the ORC and OBR segments uniquely identify observations. The field in each segment must contain the same value. If an observation requires correction, the observation data in new message with a new *Message control id* (MSH-10) and the same *Filler Order Number* (ORC-3 and OBR-3) will replace the observation data in the HDR. Table 32)
ORC-14	Call Back Phone Number	XTN		(the field is not supported)

Field	Name	Type	Example	VA use or definition
ORC-15	Order effective Date/Time	TS		(the field is not supported)
ORC-16	Order Control Code Reason	CE		(the field is not supported)
ORC-17	Entering Organization	CE	<facility number>~<facility name>~L	Table 33
ORC-18	Entering Device	CE		(the field is not supported)
ORC-19	Action By	XCN		(the field is not supported)
ORC-20	Advanced Beneficiary Notice Code	CE		(the field is not supported)
ORC-21	Ordering Facility Name	XON		Table 34
ORC-22	Ordering Facility Address	XAD		(the field is not supported)
ORC-23	Ordering Facility Phone Number	XTN		(the field is not supported)
ORC-24	Ordering Provider Address	XAD		(the field is not supported)
ORC-25	Order Status Modifier	CWE		(the field is not supported)

Table 31: VA Filler Order Number in ORC-3 and OBR-3 (HL7 EI Data Type)

Component	Name	Type	Value
Oxx-3.1	Entity Identifier	ST	Sequential number concatenated with current date/time
Oxx-3.2	Namespace ID	IS	Vendor identifier from Table 80
Oxx-3.3	Universal ID	ST	(the component is not supported)
Oxx-3.4	Universal ID Type	ID	(the component is not supported)

The *Filler Order Number* fields of the ORC and OBR segments uniquely identify observations. The field in each segment must contain the same value. If an observation requires correction, the

observation data in new message with a new *Message control id* (MSH-10) and the same *Filler Order Number* (ORC-3 and OBR-3) will replace the observation data in the HDR.

Table 32: VA Person Location in ORC-13 (HL7 PL Data Type)

Component	Name	Type	Value
ORC-13.1	Point of Care	IS	"HT" (fixed value)
ORC-13.2	Room	IS	(the component is not supported)
ORC-13.3	Bed	IS	(the component is not supported)
ORC-13.4	Facility	HD	(the component is not supported)
ORC-13.5	Location status	IS	(the component is not supported)
ORC-13.6	Person location type	IS	(the component is not supported)
ORC-13.7	Building	IS	(the component is not supported)
ORC-13.8	Floor	IS	(the component is not supported)
ORC-13.9	Location description	ST	Vendor facility name (Table 82)

Table 33: VA Entering Facility in ORC-17 (HL7 CE Data Type)

Component	Name	Type	Value
ORC-17.1	Identifier	ST	Facility number
ORC-17.2	Text	ST	Facility name
ORC-17.3	Name of coding system	IS	"L" (fixed value)
ORC-17.4	Alternate identifier	ST	(the component is not supported)
ORC-17.5	Alternate text	ST	(the component is not supported)
ORC-17.6	Name of Alternate Coding System	IS	(the component is not supported)

Table 34: VA Ordering Facility in ORC-21 (HL7 XON Data Type)

Component	Name	Type	Value
ORC-21.1	Organization Name	ST	Facility Name from DFN (see Table 16)
ORC-21.2	Organization Name Type Code	ST	(the component is not supported)
ORC-21.3	ID Number	NM	(the component is not supported)
ORC-21.4	Check Digit	NM	(the component is not supported)
ORC-21.5	Code identifying Check Digit Scheme Employed	ST	(the component is not supported)
ORC-21.6	Assigning Authority	HD	(the component is not supported)
ORC-21.7	Identifier Type	IS	(the component is not supported)
ORC-21.8	Assigning Facility ID	HD	(the component is not supported)
ORC-21.9	Name of Representation Code	ID	(the component is not supported)

The observation request (OBR) segment is present for each order and identifies the observation set that was collected. The information for the observation set is given in Table 35.

Table 35: VA OBR Segment

Field	Name	Type	Example	VA use or definition
OBR-1	Set ID	SI	(as appropriate – optional for single observation message, required for multiple observation message)	(HL7 2.4 standard)
OBR-2	Placer Order Number	EI		(the field is not supported)
OBR-3	Filler Order Number	EI	0012004120816 05-0500~Home Telehealth	(see ORC-3)
OBR-4	Universal Service Identifier	CE[53]	4500638~TEMPERATURE~99VA120.51	(Table 36)
OBR-5	Priority	ID		(the field is not supported)
OBR-6	Requested Date/Time	TS		(the field is not supported)
OBR-7	Observation Date/Time	TS	Date/time of observation	Date and time that the observation set was started (made/taken)[54]
OBR-8	Observation End Date/Time	TS		The date/time when the observation was completed (may be same for instantaneous observations)
OBR-9	Collection Volume	CQ		(the field is not supported)
OBR-10	Collector Identifier	XCN		(the field is not supported)
OBR-11	Specimen	ID		(the field is not supported)

[53] This field must be upper case.

[54] The time in OBR-7 should be the same for all observations taken during a collection session. The actual time should be the time of the collected observation.

Field	Name	Type	Example	VA use or definition
	Action Code			
OBR-12	Danger Code	CE		(the field is not supported)
OBR-13	Relevant Clinical Information	ST		(the field is not supported)
OBR-14	Specimen Received Date/Time	TS		(the field is not supported)
OBR-15	Specimen Source	CM_SPS		(the field is not supported)
OBR-16	Ordering Provider	XCN		(the field is not supported)
OBR-17	Order Callback Phone Number	XTN		(the field is not supported)
OBR-18	Placer Field 1	ST		(the field is not supported)
OBR-19	Placer Field 2	ST		(the field is not supported)
OBR-20	Filler Field 1 +	ST		(the field is not supported)
OBR-21	Filler Field 2 +	ST		(the field is not supported)
OBR-22	Results Rpt/Status Chng Date/Time +	TS		The date/time the results were reported.[55]
OBR-23	Charge to Practice +	CM_MOC		(the field is not supported)
OBR-24	Diagnostic Serv Sect ID	ID		(the field is not supported)
OBR-25	Result Status +	ID	F	(Table 38)[56]
OBR-26	Parent Result +	CM_PRL		(the field is not supported)
OBR-27	Quantity/Timing	TQ		(the field is not supported)
OBR-28	Result Copies to	XCN		(the field is not supported)
OBR-29	Parent	CM_EIP		(the field is not supported)
OBR-30	Transportation Mode	ID		(the field is not supported)
OBR-31	Reason for Study	CE		(the field is not supported)
OBR-32	Principal Result	CM_NDL		(the field is not supported)

[55] The results changed date/time (OBR-22) is not used by Home Telehealth.

[56] The Home Telehealth program only supports the values of **E** (*entered in error*) or **F** (*final*)

Field	Name	Type	Example	VA use or definition
	Interpreter +			
OBR-33	Assistant Result Interpreter +	CM_NDL		(the field is not supported)
OBR-34	Technician +	CM_NDL		Person who entered the vital sign[57]
OBR-35	Transcriptionist +	CM_NDL		(the field is not supported)
OBR-36	Scheduled Date/Time +	TS		(the field is not supported)
OBR-37	Number of Sample Containers *	NM		(the field is not supported)
OBR-38	Transport Logistics of Collected Sample *	CE		(the field is not supported)
OBR-39	Collector's Comment *	CE		(the field is not supported)
OBR-40	Transport Arrangement Responsibility	CE		(the field is not supported)
OBR-41	Transport Arranged	ID		(the field is not supported)
OBR-42	Escort Required	ID		(the field is not supported)
OBR-43	Planned Patient Transport Comment	CE		(the field is not supported)
OBR-44	Procedure Code	CE		(the field is not supported)
OBR-45	Procedure Code Modifier	CE		(the field is not supported)
OBR-46	Placer Supplemental Service Information	CE		(the field is not supported)
OBR-47	Filler Supplemental	CE		(the field is not supported)

[57] This field is not used by Home Telehealth

Field	Name	Type	Example	VA use or definition
	Service Information			

Table 36: VA Observation Identifier in OBR-4 and OBX-3 (HL7 CE Data Type)

Component	Name	Type	Value
OBx-x.1	Identifier[58]	ST	VUID (for observation name) (Table 84 and Table 86 – VUID column) ***Qualifiers*** (for observation qualifier) ***Error Reasons*** (for an entry error)
OBx-x.2	Text	ST[59]	Table 84 column 1 (vital sign observation) Table 86 column 1 (lab result observation) null (for observation qualifier)
OBx-x.3	Name of Coding System	IS	99VA120.51 (for vital sign) 99VA120.52 (for lab result)
OBx-x.4	Alternate Identifier	ST	(the component is not supported)
OBx-x.5	Alternate Text	ST	(the component is not supported)
OBx-x.6	Name of Alternate Coding System	IS	(the component is not supported)

Table 37: VA Observation Identifier in OBR-4 and OBX-3 Examples

Identifier	Example
Observation	4500638~TEMPERATURE~99VA120.51
Qualifier	Qualifiers Error Reasons

Table 38: VA Result Status in OBR-25

Value	Description
O	Order received; specimen not yet received
I	No results available; specimen received, procedure incomplete

[58] *Qualifier* or *Error Reasons* identifier is only used in a qualifier OBX segment. The OBR identifier is used to define the submission value in both the OBR and OBX segments.

[59] The vital sign or laboratory result name is case sensitive; the name must be in upper case.

Value	Description
S	No results available; procedure scheduled, but not done
A	Some, but not all, results available
P	Preliminary: A verified early result is available, final results not yet obtained
C	Correction to results
R	Results stored; not yet verified
E	Entered in error; date/time stamp questionable, reading is questionable
F	Final results; results stored and verified. Can only be changed with a corrected result.
X	No results available; Order canceled.
Y	No order on record for this test. (Used only on queries)
Z	No record of this patient. (Used only on queries)

The observation/result (OBX) segment contains the vitals observations. There is at least one OBX segment for each vitals observation. The first OBX segment contains the identification of the observation, the actual observation, the date/time of the observation, and the source of the observation. There may be a second OBX segment if an observation qualifier is required; more OBX segments are used if multiple qualifiers are required.

Identification of the observation (vital sign or laboratory result) is in the OBX-3 field (*Observation Identifier*). The observation identifiers, units, and ranges for the required observations are given in Section 5. The observation data type is in the OBX-2 field (*Value Type*). The data type for an observation is ST; the data type for a qualifier is CE. The identifier for the observation is contained in OBX-3. The identifier for an observation value should match the identifier in the OBR-4 field. The units of the value are in the OBX-6 field (*Units*). The date/time of the observation is given in OBX-14 (*Date/Time of the Observation*). The format of the date/time is defined in Table 4. The observation method is in the OBX-17 field (*Observation Method*). The valid methods are defined in Table 80. The Home Telehealth device identity is in the OBX-17 field (*Equipment Instance Identifier*). The valid Home Telehealth devices are defined in Table 80.

The identifier for an observation qualifier is the string *Qualifiers* in the OBX-3 field. The qualifier for the observation is in the OBX-5 field (*Observation Value*) of the qualifier segment using a data type of CE. The VA requires standardized qualifiers to be used for all observation qualifiers; no observation may have a non-standardized qualifier. The standardized qualifiers are defined in Table 85 and Table 87.

The identifier for error qualifier is the string *Error Reasons* in the OBX-3 field. An error qualifier is used to indicates that the submission did not comply with the date/time business rules. All submissions that are sent to the HDR and do not comply with the data/time business rules must have the status of "*entered in error*" in OBR-25 and have an OBX qualifier segment defining the error. A error reasons qualifier segement clarifies the error detection OBX-5 (Table

40)[60] gives the details, OBX-11 marks the error as final, and OBX-16 indicates that the vendor detected the error.

Table 39: VA OBX Segment

Field	Name	Type	Example	VA use or definition
OBX-1	Set ID	SI	(as appropriate – optional for single observation message, required for multiple observation message)	Correlates with OBR-1
OBX-2	Value Type[61]	ID	ST	ST (for observation) CE (for observation qualifier or entry error) TX (for general text)
OBX-3	Observation Identifier	CE	4500638~TEMPERATURE ~99VA120.51	Table 36
OBX-4	Observation Sub-Id	CE		(the field is not supported)
OBX-5	Observation Value	*[62]	99.1	(HL7 2.4 standard)
OBX-6[63]	Units	CE	4500991~F~VHA_ERT	See Table 84 and Table 86 for the units used for each observation.
OBX-7	References Range	ST		(the field is not supported)
OBX-8	Abnormal Flags	IS		(the field is not supported)

60 Specific text may be added in the text component (OBX-5.1) after the standard prefix referenced in Table 40.

61 If the OBX contains an observation value, the observation value field (OBX-5) contains the value of the observation converted to a string. If the OBX contains an observation qualifier or error reason qualifier, the observation value field (OBX-5) contains the qualifier stored in a CE data type in the form given in Table 40. The OBX segment can be used to carry general text in the observation value field; this use of the general text is noted in the message types that use the segment in this manner

62 The *value type* field (OBX-2) contains the HL7 data type for the *observation value* field (OBX-5). The VA uses a data type of ST for observation values, CE for observation qualifiers and entry errors, and TX For general text.

63 OBX-5 is repeated in OBX-6 for error reason qualifier.

Field	Name	Type	Example	VA use or definition
OBX-9	Probability	NM		(the field is not supported)
OBX-10	Nature of Abnormal Test	ID		(the field is not supported)
OBX-11	Observation Result Status	ID	F	The potential values are: F – final results R – Results entered – not verified (Home Telehealth uses F for machine entered and R for self entered values)
OBX-12	Date Last Observation Normal Value	TS		(the field is not supported)
OBX-13	User Defined Access Checks	ST		(the field is not supported)
OBX-14	Date/Time of the Observation	TS	Date and time observation taken by home device.	(HL7 2.4 standard)
OBX-15	Producer's ID	CE		(the field is not supported)
OBX-16	Responsible Observer	XCN	<facility number>~<vendor name>	(Error detected by vendor)
OBX-17	Observation Method	CE[64]	4500983~DEVICE ENTERED~VHA_ERT	Table 42
OBX-18	Equipment Instance Identifier	EI	Home device identification	Table 43
OBX-19	Date/Time of the Analysis	TS		(the field is not supported)

Table 40: VA Observation Qualifier or Error in OBX-5 (HL7 CE Data Type)

Component	Name	Type	Value
OBX-5.1	Identifier	ST	VUID (for qualifier name) Table 85 *Vital Sign Qualifier VUID* column Table 88 *Submission Error Qualifier VUID* column

[64] This field must be in upper case.

Component	Name	Type	Value
			Table 87 *Lab Result Qualifier VUID* column
OBX-5.2	Text[65]	ST	Table 85 *Vital qualifier (text)* column Table 88 *Submission Error Qualifier (text)* column Table 87 *Lab qualifier* column (lab result)
OBX-5.3	Name of Coding System	IS	99VA120.52 (for qualifier) 99VA8986.1 (for entry error)
OBX-5.4	Alternate Identifier	ST	(the component is not supported)
OBX-5.5	Alternate Text	ST	(the component is not supported)
OBX-5.6	Name of Alternate Coding System	IS	(the component is not supported)

Table 41: VA Observation Unit in OBX-6 (HL7 CE Data Type)

Component	Name	Type	Value
OBX-6.1	Identifier	ST	Table 84 or Table 86 Units VUID column
OBX-6.2	Text[66]	ST	Table 84 or Table 86 Units column
OBX-6.3	Name of Coding System	IS	VHA_ERT
OBX-6.4	Alternate Identifier	ST	(the component is not supported)
OBX-6.5	Alternate Text	ST	(the component is not supported)
OBX-6.6	Name of Alternate Coding System	IS	(the component is not supported)

Table 42: VA Observation Method in OBX-17 (HL7 CE Data Type)

Component	Name	Type	Value
OBX-17.1	Identifier	ST	Table 83 VUID column
OBX-17.2	Text[67]	ST	Table 83 Code column
OBX-17.3	Name of Coding System	IS	VHA_ERT
OBX-17.4	Alternate Identifier	ST	(the component is not supported)
OBX-17.5	Alternate Text	ST	(the component is not supported)
OBX-17.6	Name of Alternate Coding System	IS	(the component is not supported)

Table 43: VA Equipment Instance in OBX-18 (HL7 EI Data Type)

Component	Name	Type	Value
OBX-18.1	Entity Identifier	ST	Table 82 Facility name column
OBX-18.2	Namespace ID	ST	Device model

65 This field must be in the exact case of the text in the specified table.

66 The text must be in the exact case of the text in the specified table.

67 The text must be in the exact case of the text in the specified table.

Component	Name	Type	Value
OBX-18.3	Universal ID	IS	Measurement device model[68]
OBX-18.4	Universal ID Type	ST	(the component is not supported)

The ZSC segment identifies the clinic stop codes that identify the data source. Table 44 defines the ZSC segment fields.

Table 44: VA ZSC Segment

Field	Name	Type	Home Telehealth requirement	VA use or definition
ZSC-1	Set ID	SI	(as appropriate – optional for single observation message, required for multiple observation message)	Correlates with OBR-1
ZSC-2	Clinic Stop Code	IS	683	(Table 89 - Code)
ZSC-3	Clinic Stop Name	ST	NONVIDEO HOME TELEHEALTH MONIT	(Table 89 - Name)
ZSC-4	Clinic Cost Distribution Center	NM		(the field is not supported)
ZSC-5	Clinic Currently Exempt from Classification	ID		(the field is not supported)

3.2.5.2 Example

The following is an example of an observation message. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^) and
- field components are separated by a "tilde" (~).

Variable entities are enclosed in "<" and ">"; the actual value is chosen from a table associated with the variable. The Home Telehealth vendor server must generate all mandatory fields. The examples were created by the Home Telehealth emulator.

[68] Self-entered measurements do not have a "measurement device" (OBX-18.3).

MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^HTH HDR^200H~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20051022154408-0500^^ORU~R01^620051022154408^T^2.4^^^AL^AL^USA^^^^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East West Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^

ORC^RE^^220051022154408~Telehealth XYZ Corp^^CM^^^^^^^^HT~~~~~~~~~Telehealth XYZ Corp^^^^200Tx~Telehealth XYZ Corp~L^^^^^^^

OBR^1^^220051022154408~Telehealth XYZ Corp^4500638~TEMPERATURE~99VA120.51^^^20051022154408-0500^^^^^^^^^^^^^^^^^F^^^^^^^^^^^^^^^^^^^^

OBX^1^ST^4500638~TEMPERATURE~99VA120.51^^99.1^4500991~F~VHA_ERT^^^^^F^^^20051022154408-0500^^^4500983~DEVICE ENTERED~VHA_ERT^Telehealth XYZ Corp~model 123Bv1.2~model 789r.2^

OBX^1^CE^Qualifiers^^4500642~ORAL~99VA120.52^^^^^^^^^^^^^^

ZSC^1^683^NONVIDEO HOME TELEHEALTH MONIT^0.000000^

Figure 8: Observation Message (Temperature)

MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^HTH HDR^200H~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20051022154408-0500^^ORU~R01^720051022154408^T^2.4^^^AL^AL^USA^^^^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East West Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^

ORC^RE^^320051022154408~Telehealth XYZ Corp^^CM^^^^^^^^HT~~~~~~~~~Telehealth XYZ Corp^^^^200Tx~Telehealth XYZ Corp~L^^^^^^^

OBR^1^^320051022154408~Telehealth XYZ Corp^4500640~BLOOD GLUCOSE~99VA120.51^^^20051022154408-0500^^^^^^^^^^^^^^^^^F^^^^^^^^^^^^^^^^^^^^

OBX^1^ST^4500640~BLOOD GLUCOSE~99VA120.51^^201^4500985~mg/dl~VHA_ERT^^^^^F^^^20051022154408-0500^^^4500983~DEVICE ENTERED~VHA_ERT^Telehealth XYZ Corp~model 123Bv1.2~model 789r.2^

ZSC^1^683^NONVIDEO HOME TELEHEALTH MONIT^0.000000^

Figure 9: Observation Message (Blood Glucose)

MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^HTH HDR^200H~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20051022154408-0500^^ORU~R01^820051022154408^T^2.4^^^AL^AL^USA^^^^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East West Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^

ORC^RE^^420051022154408~Telehealth XYZ Corp^^CM^^^^^^^^HT~~~~~~~~~Telehealth XYZ Corp^^^^200Tx~Telehealth XYZ Corp~L^^^^^^^

OBR^1^^420051022154408~Telehealth XYZ Corp^4500634~BLOOD PRESSURE~99VA120.51^^^20051022154408-0500^^^^^^^^^^^^^^^^^F^^^^^^^^^^^^^^^^^^^^

OBX^1^ST^4500634~BLOOD PRESSURE~99VA120.51^^180/106^4500986~mmHg~VHA_ERT^^^^^F^^^20051022154408-0500^^^4500983~DEVICE ENTERED~VHA_ERT^Telehealth XYZ Corp~model 123Bv1.2~model 789r.2^

OBX^1^CE^Qualifiers^^4500641~ADULT CUFF~99VA120.52^^^^^^^^^^^^^^

ZSC^1^683^NONVIDEO HOME TELEHEALTH MONIT^0.000000^

Figure 10: Observation Message (Blood Pressure)

```
MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^HTH HDR^200H~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20051022154408-0500^^ORU~R01^920051022154408^T^2.4^^^AL^AL^USA^^^^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East West Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^veteran^^^N^

ORC^RE^^520051022154408~Telehealth XYZ Corp^^CM^^^^^^^^HT~~~~~~~~Telehealth XYZ Corp^^^^200Tx~Telehealth XYZ Corp~L^^^^^^^

OBR^1^^520051022154408~Telehealth XYZ Corp^4500636~PULSE~99VA120.51^^^20051022154408-0500^^^^^^^^^^^^^^^^^F^^^^^^^^^^^^^^^^^^^^^^^^

OBX^1^ST^4500636~PULSE~99VA120.51^^75^4500988~beats/min~VHA_ERT^^^^^F^^^20051022154408-0500^^^4500983~DEVICE ENTERED~VHA_ERT^Telehealth XYZ Corp~model 123Bv1.2~model 789r.2^

ZSC^1^683^NONVIDEO HOME TELEHEALTH MONIT^0.000000^
```

Figure 11: Observation Message (Pulse)

```
MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^HTH HDR^200H~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20051022154408-0500^^ORU~R01^1020051022154408^T^2.4^^^AL^AL^USA^^^^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East West Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^veteran^^^N^

ORC^RE^^620051022154408~Telehealth XYZ Corp^^CM^^^^^^^^HT~~~~~~~~Telehealth XYZ Corp^^^^200Tx~Telehealth XYZ Corp~L^^^^^^^

OBR^1^^620051022154408~Telehealth XYZ Corp^4500637~PULSE OXIMETRY~99VA120.51^^^20051022154408-0500^^^^^^^^^^^^^^^^^F^^^^^^^^^^^^^^^^^^^^^^^^

OBX^1^ST^4500637~PULSE OXIMETRY~99VA120.51^^97^4500990~%~VHA_ERT^^^^^F^^^20051022154408-0500^^^4500983~DEVICE ENTERED~VHA_ERT^Telehealth XYZ Corp~model 123Bv1.2~model 789r.2^

ZSC^1^683^NONVIDEO HOME TELEHEALTH MONIT^0.000000^
```

Figure 12: Observation Message (Pulse Oximetry)

```
MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^HTH HDR^200H~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20051022154408-0500^^ORU~R01^1120051022154408^T^2.4^^^AL^AL^USA^^^^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East West Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^veteran^^^N^

ORC^RE^^720051022154408~Telehealth XYZ Corp^^CM^^^^^^^^HT~~~~~~~~Telehealth XYZ Corp^^^^200Tx~Telehealth XYZ Corp~L^^^^^^^

OBR^1^^720051022154408~Telehealth XYZ Corp^4500639~WEIGHT~99VA120.51^^^20051022154408-0500^^^^^^^^^^^^^^^^^F^^^^^^^^^^^^^^^^^^^^^^^^

OBX^1^ST^4500639~WEIGHT~99VA120.51^^134^4500989~Pounds~VHA_ERT^^^^^F^^^20051022154408-0500^^^4500983~DEVICE ENTERED~VHA_ERT^Telehealth XYZ Corp~model 123Bv1.2~model 789r.2^

OBX^1^CE^Qualifiers^^4500643~STANDING~99VA120.52^^^^^^^^^^^^^^

ZSC^1^683^NONVIDEO HOME TELEHEALTH MONIT^0.000000^
```

Figure 13: Observation Message (Weight)

```
MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^HTH HDR^200H~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20051022154408-0500^^ORU~R01^1220051022154408^T^2.4^^^AL^AL^USA^^^^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East West Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^veteran^^^N^

ORC^RE^^820051022154408~Telehealth XYZ Corp^^CM^^^^^^^^HT~~~~~~~~Telehealth XYZ Corp^^^^200Tx~Telehealth XYZ Corp~L^^^^^^^

OBR^1^^820051022154408~Telehealth XYZ Corp^4500635~PAIN~99VA120.51^^^20051022154408-0500^^^^^^^^^^^^^^^^^F^^^^^^^^^^^^^^^^^^^^

OBX^1^ST^4500635~PAIN~99VA120.51^^2^4500987~Verbal Numeric Analog Scale~VHA_ERT^^^^^F^^^20051022154408-0500^^^4500982~SELF ENTERED~VHA_ERT^Telehealth XYZ Corp~model 123Bv1.2^

ZSC^1^683^NONVIDEO HOME TELEHEALTH MONIT^0.000000^
```

Figure 14: Observation Message (Pain)

```
MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^HTH HDR^200H~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20051022154408-0500^^ORU~R01^1220051022154408^T^2.4^^^AL^AL^USA^^^^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East West Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^veteran^^^N^

ORC^RE^^820051022154408~Telehealth XYZ Corp^^CM^^^^^^^^HT~~~~~~~~Telehealth XYZ Corp^^^^200Tx~Telehealth XYZ Corp~L^^^^^^^

OBR^1^^820051022154408~Telehealth XYZ Corp^4500635~PAIN~99VA120.51^^^20051022154408-0500^^^^^^^^^^^^^^^^^E^^^^^^^^^^^^^^^^^^^^

OBX^1^ST^4500635~PAIN~99VA120.51^^2^4500987~Verbal Numeric Analog Scale~VHA_ERT^^^^^F^^^20051022154408-0500^^^4500982~SELF ENTERED~VHA_ERT^Telehealth XYZ Corp~model 123Bv1.2^

OBX^1^CE^Error Reasons^^4500625~Incorrect date/time~99VA8985.1^4500625~Incorrect date/time~99VA8985.1^^^^^F^^^^^200Tx~HOME TELEHEALTH VENDOR^

ZSC^1^683^NONVIDEO HOME TELEHEALTH MONIT^0.000000^
```

Figure 15: Observation Message with Error Reasons (Pain)

3.2.6 Acknowledge Message Content

The message content is given in the *VA Home Telehealth1 HL-7 Message formats* document. The HDR server does not generate an acknowledgement when it has processed the observation message. The local VIE indicates the acceptance of the observation for delivery to the HDR in the commit acknowledgement. Section 3.1.6 contains the general discussion of the commit acknowledgement.

3.2.6.1 Message Format

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard and section 3.12.5.

3.2.6.2 Example

The following example is of an acknowledgement that indicates a successful completion of a request. The example was created by the Home Telehealth emulator for the first ORU-R01 (temperature) message above.

```
MSH^~|\&^HTH HDR^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^2005102215440
8-0500^^ACK~R01^620051022154408^T^2.4^^^ER^NE^USA^^^^

MSA^CA^620051022154408^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 16: Observation Acceptance (Commit acknowledgement)

3.3 MPI Subscription

The objective of the subscription function is to notify the Master Patient Index (MPI) that the vendor server contains information for a registered patient. This notification will also enable the MPI to send updates to the Vendor Server with changes to patient demographics data or indices associated with the patient (ICN, DFN, and SSN). The acknowledgement message from the MPI server indicates the acceptance or non-acceptance of the subscription request. This function is part of the overall patient sign up process and is a priority one function. If the MPI rejects the subscription, the vendor server must reject the sign up that initiated the subscription. If the MPI response would create an inconsistency in the vendor database, the vendor server must reject the sign up request.

3.3.1 Description

The data in the subscription HL7 message links the Home Telehealth system to a particular patient record in the MPI and subscribes to patient identity and demographics updates from the MPI. The subscription will notify the MPI to send updates of the patient demographics information via HL7; the vendor server must process the updates sent by the MPI server (section 3.4).

After the acceptance of a sign up message, the vendor server must notify the MPI server that it is holding information for the patient and should receive updates of the patient's information, such as name change, date of birth change, SSN change, DFN change, or ICN change.

The overall message flow starts with the issuance of an MPI query for the patient record. The query uses the patient sign up facility identity (DFN) from the sign up function (section 3.1). The query must activate the "*Record Linking Action*" that marks the vendor server as an associated Treating Facility for the DFN in the query. This request will return an RSP message that should contain the same PID that was in the original sign up message. This

acknowledgement contained in the message must be processed; the PID must be validated against the one received in the sign up message.[69] If the two PIDs do not agree, a negative acknowledgement must be sent to both the MPI and the sign up VistA server.[70] Any changes to the patient demographics information received by the MPI are sent to the vendor server in ADT-A24, ADT-A43, or ADT-A08 messages as appropriate (section 3.4).

3.3.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; they are listed in sequential order.

3.3.2.1 Home Telehealth vendor server Responsibilities

The Home Telehealth vendor server accepts and processes the Sign up message (section 3.1). If the vendor server accepts the sign up, it must send a "subscribe to patient VA identity update" message to the MPI. The "subscribe to patient VA identity update" message is used to alert the MPI that the Home Telehealth vendor server needs to be notified of any published updates to a patient record, such as name change, SSN change, and/or ICN change.

3.3.2.2 Interface Engine Responsibilities

The Interface Engine routes the message from the Home Telehealth vendor server through the Austin Interface Engine to the MPI server. The Interface Engine routes Acknowledgement messages originating at the MPI server to the Home Telehealth vendor server.

3.3.2.3 MPI Responsibilities

The MPI accepts and processes the "subscription request" from the Home Telehealth vendor server and sends acknowledgement back to Home Telehealth vendor server indicating that the request will be honored. If the MPI server is not able to honor the request, a negative acknowledgement message will be sent. If the MPI is able to honor the request, an RSP message will be sent with the PID of the patient. The RSP message will contain the acknowledgement; the MPI will not use a separate ACK message.

---

[69] The verification is accomplished by comparing the standardized form of each name along with the DOB and the indicies (ICN, DFN and SSN) in the messages. The standardized form of a name is given in Appendix L.

[70] The sign up VistA server has an outstanding message at this point. The original sign up message is not acknowledged until the MPI subscription has completed.

3.3.2.4 VistA Responsibilities

VistA is not involved in the notification to MPI process.

3.3.2.5 User Responsibilities

There is no user involved in the notification to MPI process.

3.3.2.6 HDR Responsibilities

HDR is not involved in the notification to MPI process.

3.3.3 Required Data Items

The notification process requires the following fundamental data items:

- Home Telehealth vendor server identification
- Patient ICN
- Patient record number
- Patient record facility identification

Table 45: Home Telehealth Vendor Server MPI Subscription Data Items

Data item	Use	Source
Home Telehealth vendor server identification	Placed in MSH and OBX segments to identify the vendor server and vendor server application	Table 80 and Table 81
Patient ICN	National index for the patient (unique identity within the VA), sent to the HDR (section 3.2)	PID-3 (Table 14 and Table 15)
Patient Name	Legal name of the patient, sent to the HDR (section 3.2)	PID-5 (Table 13)
Patient SSN	US index for the patient (unique identity within the US), sent to the HDR (section 3.2)	PID-3 (Table 14 and Table 15)
Patient's local phone number	Contact number for patient	PID-13 (Table 13)
Patient's record number in sign up VistA facility (DFN)	VistA facility index for the patient (unique identity within VistA facility), sent to the HDR (section 3.2) to identify the patient	PID-3 (Table 14 and Table 15)
Sign up facility number	Identify the source of sign up message and identification of source of indices and names	MSH-4 (Table 6) and various places in PID (Table 13), PD1, and PV1 segments
Sign up facility DNS	Identify the source of sign up	MSH-4 (Table 6)

Data item	Use	Source
	message	
Sign up facility identification	Identify the source of indices and names	Various locations in PID (Table 13), PD1 (Table 23), and PV1 (Table 25) segments
Patient DOB	Aid in the manual resolution of data integrity issues	PID-7 (Table 13)

Integrated patients are identified by ICN. All patients are identified in an HL7 message by the ICN; any HL7 message that does not contain an ICN to identify the patient is to be rejected. If the identified patient is present in the vendor database, the patient name, SSN, DFN[71], name and DOB are to be verified using the rules in Table 4. The HL7 standard defines that any comparison between components as a string comparison. If one of the comparison terms is null, then the comparison is considered as valid; otherwise, the compassion of terms is the comparison of two strings. If the patient is currently active, the stored DFN must match the update.

3.3.4 Data Nomenclature

The facility identification comes from the institution file. All other information comes from sign up message (section 3.1)

3.3.5 MPI Subscription Message Content

The *Master Patient Index (MPI)/Patient Demographics (PD) HL7 Interface Specification* document defines the message content. The notification function uses the QBP/RSP *Q22/K22 Find Candidates* query Message as documented in chapter 3 of the HL7 standard. The Home Telehealth vendor server sends an MPI Subscription message to the MPI server after processing a patient sign up message.

3.3.5.1 Message Format

The MPI subscription HL7 message has three required data segments that contain the following information: message identification (MSH), query parameter definition (QPD), and response control parameters (RCP). Table 46 lists the segment in a QBP-Q22 message. The *required*

[71] The DFN should be treated as a tuple: local index and facility number. The index portion the DFN is only unique within the assigning facility. All comparisons between two DFNs must include both the index and the facility number. DFN_a and DFN_b are equal if and only if the ID component of DFN_a equals the ID component of DFN_b and the assigning facility of DFN_a equals the assigning facility of DFN_b.

column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 46: Home Telehealth QBP-Q22 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
EVN	Event Type	Required	Date and time of sign up/activation
QPD	Query Parameter Definition	Required	Query parameters
RCP	Response Control Parameters	Required	Response contents
DSC	Continuation Pointer	Optional	(not used by Home Telehealth)

The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The items of interest in the QPD data segment (Table 47) are the DFN of the patient and the subscription request (*Record Linking Action*). The item of interest in the response control parameters (RCP) segment (Table 49) is number of required responses; the vendor server should ask for one response.

Table 47: VA QPD Segment

Field	Name	Type	Example	VA use or definition
QPD-1	Message query name	CE	Q22~FIND CANDIDATES~HL72.4	Fixed component values
QPD-2	Query tag	ST	111069	Unique identifier to be matched by response, must remain unique until response is received
QPD-3	User parameters	*[72]	Sequence of components of the form @PID.<field>.<component>~<value>	Find target
QPD-4	User	ST	VHA MPI	Matching

[72] This field is best described as a repeating component field. The component that is repeating is not a currently defined component in the HL7 2.4 standard. The component is {ST,HD}. The ST component is "@PID.x.y", which identifies the PID component to match. The HD component is the match target. The standard definition of a repeating ST field will not work.

Field	Name	Type	Example	VA use or definition
	parameters			algorithm name
QPD-5	User parameters	ST	1.0	Matching algorithm version
QPD-6	User parameters	TS	TF – add the site sending the query to the Treating Facility List AS – add the site sending the query to the site association for the Treating Facility for the sate associated with the DFN BT – add both the TF and the AS NT – add neither the TF or the AS (default)	Record linking action Home Telehealth uses BT

Table 48 defines the contents of QPD-3 for a DFN search. The target DFN would be 12345678~~~USVHA&&0363~PI~<VA facility name>&<VA facility number>&L as described shown in Table 16.

Table 48: VA QPD-3 Components for DFN Search

Field	Use	Component value from example in Table 16	Search value
QPD-3.1	PID field and component to use for search	@PID.3.1	DFN value
QPD-3.2	Value of PID field and component	123456789	
QPD-3.3	PID field and component to use for search	@PID.3.2	Check digit
QPD-3.4	Value of PID field and component	(null)	(component is not used by the VA)
QPD-3.5	PID field and component to use for search	@PID.3.3	Check digit algorithm
QPD-3.6	Value of PID field and component	(null)	(component is not used by the VA)
QPD-3.7	PID field and component to use for search	@PID.3.4	Assigning authority
QPD-3.8	Value of PID field and component	USVHA&&0363	
QPD-3.9	PID field and component to use for	@PID.3.5	Identifier type (DFN)

Field	Use	Component value from example in Table 16	Search value
	search		
QPD-3.10	Value of PID field and component	PI	
QPD-3.11	PID field and component to use for search	@PID.3.6	Assigning facility
QPD-3.12	Value of PID field and component	<VA facility name>&<VA facility number>&L	Facility in L format (Table 8)

Table 49: VA RCP Segment

Field	Name	Type	Example	VA use or definition
RCP-1	Query priority	ID	I	(fixed value)
RCP-2	Quantity limited request	CQ	1~RD	(HL7 2.4 standard)
RCP-3	Response modality	CE	R	(fixed value)
RCP-4	Execution and delivery time	TS		(the field is not supported)
RCP-5	Modify indicator	ID	N	(fixed value)
RCP-6	Sort-by field	ST		(the field is not supported)
RCP-7	Segment group inclusion	ID		(HL7 2.4 standard)
RCP-9	Collection Volume	CQ		(the field is not supported)

3.3.5.2 Example

The following example contains five segments. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^) and
- field components are separated by a "tilde" (~).

The example was created by the Home Telehealth emulator.

```
MSH^~|\&^MPI^200TX~XYZ.MED.VA.GOV~DNS^MPI^200M~TLMPI.FO-BAYPINES.MED.VA.GOV~DNS^20051022154344-0500^^QBP~Q22^320051022154344^T^2.4^^^AL^AL^USA^^^^

QPD^Q22~FIND CANDIDATES~HL72.4^2^@PID.3.1~123456789|@PID.3.2|@PID.3.3|@PID.3.4~USVHA&&L|@PID.3.5~PI|@PID.3.6~DAYTDEV&552&L^VHA MPI^1.0^BT

RCP^I^1.000000~RD^R^^N^^
```

Figure 17: MPI Subscription Message

3.3.6 QBP Acknowledge Message Content[73]

The message content is given in the *VA Home Telehealth HL-7 Message formats* document and in section 3.12. The IE generates a commit acknowledgement when it has accepted the message or a reject if it cannot forward the message. The MPI server generates an acknowledgement when it has processed the MPI notification message. The MPI indicates the acceptance of the notification request in the acknowledgement. The positive acknowledgement from the MPI will normally ride in an RSP message (section 3.3.7) along with returned data. Section 3.1.6 contains the general discussion of the commit acknowledgement.

3.3.6.1 Message Format

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard.

The HL7 Acknowledge message has three data segments. The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The Message Acknowledgement (MSA) segment identifies the message that is to be acknowledged (positively or negatively). The error (ERR) segment identifies the location of the error, if the acknowledgement indicates that the original message was rejected.

3.3.6.2 Example

The following example is of an acknowledgement that indicates a successful completion of a request. The example was created by the Home Telehealth emulator.

```
MSH^~|\&^MPI^200M~TLMPI.FO-BAYPINES.MED.VA.GOV~DNS^HTMPI^200TX~XYZ.MED.VA.GOV~DNS^20051022154344-0500^^
ACK^420051022154344^T^2.4^^^AL^NE^USA^^^^

MSA^AA^320051022154344^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 18: MPI Subscription Acceptance (Commit acknowledgement)

3.3.7 RSP Patient Find Message Content

The message content is given in the *Master Patient Index (MPI)/Patient Demographics (PD) HL7 Interface Specification* document. The MPI server generates a single message that contains both an acknowledgement and the query response. The MPI indicates the acceptance of the subscription request in the acknowledgement. The content of the PID segment in the RSP is used to verify the content of the sign up message (section 3.1).

---

[73] The MPI will normally send an RSP (section 3.3.5) to acknowledge a subscription request (QBP).

3.3.7.1 Message Format

The HL7 response message has four data segments that contain the following information: message identification (MSH), application acknowledgement (MSA and optionally ERR), query summary (QAK), and patient identification (PID). Table 50 lists the segment in an RSP-K22 message. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 50: Home Telehealth RSP-K22 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
MSA	Message Acknowledgement	Required	Application acknowledgement for QBP-A22
ERR	Error	Optional	Clarification of acknowledgment
QAK	Query Acknowledgment	Required	Number of targets found
QPD	Query Parameter Definition	Optional	(not used by Home Telehealth)
PID	Patient Identification	Required	Patient
PD1	Additional Demographics	Optional	(not used by Home Telehealth)
QRI	Query Response Instance	Optional	(not used by Home Telehealth)
DSC	Continuation Indicator	Optional	(not used by Home Telehealth)

The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The Message Acknowledgement (MSA) segment identifies the query message that is being acknowledged (positively or negatively). The QPD segment identifies the query (QBP-Q22) that is being satisfied. The QAK segment (Table 51) identifies the number of patients that were found as the result of the query; Home Telehealth expects only one patient to be found. If no patients are found, then the registration request failed and the patient should not be established in the vendor server. The PID segment is contains the identity and demographics for the keys presented in the query (section 3.3.5); the PID segment is defined in Table 13.

Table 51: VA QAK Segment

Field	Name	Type	Example	VA use or definition
QAK-1	Query tag	ST	320051022154344	(the Control ID, MSH-10, of the message that

Field	Name	Type	Example	VA use or definition
				initiated the query)[74]
QAK-2	Query response status	ID	OK	(HL7 Table 0208)
QAK-3	Message query name	CE	Q22~FIND CANDIDATES~HL72.4	(from QDP-1)
QAK-4	Hit count total	NM	1	Number of finds
QAK-5	This payload	NM		(the field is not supported)
QAK-6	Hits remaining	NM		(the field is not supported)

3.3.7.2 Example

The following example is of an acknowledgement that indicates a successful completion of a request. The example was created by the Home Telehealth emulator.

```
MSH^~|\&^MPI^200M~TLMPI.FO-BAYPINES.MED.VA.GOV~DNS^HTMPI^200TX~XYZ.MED.VA.GOV~DNS^20051022154344-0500^^
RSP~K22^420051022154344^T^2.4^^^AL^AL^USA^^^^

MSA^AA^320051022154344^^^^

ERR^~0.000000~0.000000~0&Message accepted

QAK^320051022154344^OK^Q22~FIND CANDIDATES~HL72.4^1.000000^^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789
~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East We
st Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^
```

Figure 19: MPI Query Response with Acceptance (Application Acknowledgement)

3.3.8 RSP Acknowledge Message Content

The message content is given in the *VA Home Telehealth1 HL-7 Message formats* document. The vendor server generates an acknowledgement when it has processed the MPI response message. The acknowledge indicates the acceptance of the response message.

[74] The MPI set QAK-1 to the Control ID (MSH-10) found the first message segment of the requesting message (QBP-Q22).

3.3.8.1 Message Format

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard.

The HL7 Acknowledge message has three data segments. The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The Message Acknowledgement (MSA) segment identifies the message that is to be acknowledged (positively or negatively). The error (ERR) segment identifies the location of the error, if the acknowledgement indicates that the original message was rejected.

3.3.8.2 Example

The following example is of an acknowledgement that indicates a successful completion of a request. The examples were created by Home Telehealth emulator. The application acknowledgement in the example requests a commit acknowledgement.

```
MSH^~|\&^HTMPI^200TX~XYZ.MED.VA.GOV~DNS^MPI^200M~TLMPI.FO-BAYPINES.MED.VA.GOV~DNS^20051022154344-0500^^
ACK~K22^520051022154344^T^2.4^^^AL^NE^USA^^^^

MSA^AA^420051022154344^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 20: RSP Acceptance (Application Acknowledgement)

3.4 Patient VA Identity and Demographics Update

The objective of the patient identity and demographics update function is to correct and maintain the patient identity indices and demographics information held by the Home Telehealth System. The acknowledgement message indicates the acceptance or non-acceptance of the update. The patient demographics function is part of the sign up process; the sign up process is a priority one function.

3.4.1 Description

The patient demographics registered with the Home Telehealth vendor server may change over time. In support of the change of patient demographics, the MPI server will send demographics updates to the Home Telehealth vendor server via HL7 messaging. The vendor server must acknowledge the messages. Critical requirements in the sign up message exchanges are the accurate transfer and storage of the name, social security number (SSN), ICN, VAMC patient record number (DFN), and sign up facility identification. The ICN is the critical patient identifier; it links the Home Telehealth patient data to other medical records stored within any other VHA medical system. If a subscription has been made (section 3.3), the vendor server will receive updates of the patient information from the MPI.

3.4.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; they are listed in sequential order.

3.4.2.1 MPI Responsibilities

When a change is made to the patient's demographics or the patient VA identity in the MPI database, the MPI server sends a patient demographics or a patient VA identity update to the Home Telehealth vendor server.

3.4.2.2 Interface Engine Responsibilities

The Interface Engine routes the message from the MPI server Interface Engine through the Austin Interface Engine to the appropriate Home Telehealth vendor server. The Interface Engine routes Acknowledgement messages originating at the Home Telehealth vendor server to the MPI server.

3.4.2.3 Home Telehealth vendor server Responsibilities

The Home Telehealth vendor server accepts and processes the update message (update transaction). If the vendor server accepts the update, the server must send a positive acknowledgement message to the MPI server. If the vendor server rejects the update, the server must send a negative acknowledgement message to the MPI server indicating the reason for rejection. Home Telehealth uses the ICN to identify patients. Each message from the MPI must have an ICN to identify the patient record to be updated. An update transaction from the MPI without an ICN must be rejected. There are three classes of update transactions from the MPI. One class of transactions is the ICN correction transaction; this transaction is the contents of a *Link Patient Information* message (ADT-A24). The objective of this transaction is to correct the ICN for a patient record that has an incorrect or old ICN. After the ICN has been corrected or updated, all data collected by the patient must be locatable by the ICN identified in the transaction.[75] The second type of transaction is one that corrects a patient that has two records with different ICNs; this transaction is the contents of a *Merge Patient* message (ADT-A43). After a merge has been performed, all data collected by the patient must be locatable by the ICN identified in the transaction. The third type of transaction corrects or updates all other patient demographic data; this transaction is the contents of an *Update Patient Information* message

[75] The *Link Patient Information* message is also used by VistA to associate a DFN (local record number) with an existing ICN. This type of transaction will have only one unique ICN in the message.

(ADT-A08)[76] or *Update Person Information* message (ADT-A31). This transaction is used to update the patient's name, DOB, address, phone number, SSN, and DFN along with any other fields in the PID segment. The MPI cannot change sign up facility number; thus, all data that is unique to a facility that is not the sign up facility should be ignored.

3.4.2.4 User Responsibilities

There is no user involved in the update process.

3.4.2.5 VistA Responsibilities

VistA is not involved in the update process.

3.4.2.6 HDR Responsibilities

HDR is not involved in the update process.

3.4.3 Required Data Items

Patients are generally identified by ICN and all other fields are updates to the existing data. The other fields are not to be validated since the object is to update each field. An update cannot change the VA facility that supports the patient. This must be changed via the Sign Up/Activation and Inactivation process (see sections 3.1 and 3.6). The *Merge Patient* request (ADT-A43) can use any set of fields to identify the patient.

The patient demographics update process may use the following fundamental data items:

- Home Telehealth vendor server identification
- Patient ICN
- Patient Name
- Patient SSN
- Home address
- Home phone number
- Patient record number (within VistA facility - DFN)
- Patient record facility identification
- Patient record facility number

[76] The MPI stopped sending the ADT-A08 in October 2008. All patient demographic updates distributed after October 2007 use the ADT-A31.

Table 52: Home Telehealth Vendor Server MPI Update Data Items

Data item	Use	Source
Home Telehealth vendor server identification	Placed in MSH and OBX segments to identify the vendor server and vendor server application	Table 80 and Table 81
Patient ICN	National index for the patient (unique identity within the VA), sent to the HDR (section 3.2)	PID-3 (Table 14 and Table 15)
Patient Name	Legal name of the patient, sent to the HDR (section 3.2)	PID-5 (Table 13)
Patient SSN	US index for the patient (unique identity within the US), sent to the HDR (section 3.2)	PID-3 (Table 14 and Table 15)
Patient's home phone number	Contact number for patient	PID-13 (Table 13)
Patient's home address	Location of the home equipment	PID-11 (Table 13)
Patient's record number in sign up VistA facility (DFN)	VistA facility index for the patient (unique identity within VistA facility), sent to the HDR (section 3.2) to identify the patient	PID-3 (Table 14 and Table 15)
Sign up facility number	Identify the source of sign up message and identification of source of indices and names	MSH-4 (Table 6) and various places in PID (Table 13), PD1, and PV1 segments
Sign up facility DNS	Identify the source of sign up message	MSH-4 (Table 6)
Sign up facility identification	Identify the source of indices and names	Various locations in PID (Table 13), PD1 (Table 23), and PV1 (Table 25) segments
Patient DOB	Aid in the manual resolution of data integrity issues	PID-7 (Table 13)
Consult number	The basis of the Home Telehealth assignment, used to associate a progress note with Home Telehealth	PV1-5 (Table 25)
Care Coordinator name	Person that can modify the patient's data on the vendor server, valid CCOW user	PD1-4 (Table 23)

Integrated patients are identified by ICN. All patients are identified in an HL7 message by the ICN; any HL7 message that does not contain an ICN to identify the patient is to be rejected. For all messages other than the A31, a consistency check must be performed on the identified patient in the vendor database; the check verifies that the patient in the request and the identified patient in the vendor database have the same name, SSN, DFN[77], name and DOB using the rules in Table 4. The HL7 standard defines that any comparison between components is a string comparison. If one of the comparison terms is null, then the comparison is considered as valid; otherwise, the comparison of terms is a string comparison (see section 4). If the patient is currently active, the stored DFN must match the update. The results of the consistency check should be used to gate the processing of the message. A failed consistency check indicates that the vendor patient database is not coherent with the VA patient database and requires immediate attention by the support staff.

3.4.4 Data Nomenclature

The facility name and facility number is obtained from the Institution file; other data comes from the MPI database. The patient record that is the subject of an MPI update is identified by an ICN supplied in the update transaction.

3.4.5 MPI Update Message Content

The *Master Patient Index (MPI)/Patient Demographics (PD) HL7 Interface Specification* document defines the message content. The update function uses the Admission, Discharge, and Transfer (ADT) Message as documented in chapter 3 of the HL7 standard. The event codes used are A24 (Link Patient Information), A43 (Move Patient Information – Patient Identifier List), A08 (Update Patient Information), and A31 (Update Person Information). The MPI server sends an update message to the Home Telehealth vendor server when there is a change in a patient's demographics. All historical medical data for the patient should be adjusted to reflect the update. The vendor server is not expected to maintain historical patient indices or demographics.

The ADT-A24 message is used to resolve patient VA identity changes (ICN). The message contains two PIDs. The first PID is the new patient VA identity (ICN); the second PID is the old patient VA identity (ICN). The patient is located using the ICN in the second PID segment. The first PID segment is to be used to update the patient's information. If the patient cannot be located by the ICN in the second PID, the update should be rejected. If the ICN in the first PID

[77] The DFN should be treated as a tuple: local index and facility number. The index portion the DFN is only unique within the assigning facility. All comparisons between two DFNs must include both the index and the facility number. DFN_a and DFN_b are equal if and only if the ID component of DFN_a equals the ID component of DFN_b and the assigning facility of DFN_a equals the assigning facility of DFN_b.

identifies a patient in the vendor's database, the update should be rejected.[78] If the contents of the first PID create a data safety[79] issue in the vendor's database, the update should be rejected. If the ICN in both PID segments is the same, the message correcting the linkage between a DFN and the ICN; the message should be silently discarded with the generation of a positive application ACK, if one is requested in MSH-16.

The ADT-A43 is used to correct the condition where a single patient is duplicated; two records in the vendor database are really for the same patient. The two records have the same ICN.[80] When the two records have the same ICN, the records will be identified by different MRN (SSN or DFN). The MRG segment is used to identify the patient record (identity) that is to be discarded. The patient record (identity) identified by the PID is to be retained. If the MRG does not identify a patient in the vendor's database, the update is to be rejected and ignored. If the PID does not identify a patient in the vendor's database, the patient is to be replace the patient identified by the MRG. If application of the update would create a data safety issue, the update is to be rejected. After the processing is complete, all data stored in the vendor's database that was linked to the discarded patient record should be linked to the retained (or created) patient record.[81]

The ADT-A08[82] is used to update the demographic data. The patient is identified by the ICN in the PID. The PID may contain updates for the DFN, SSN, or patient demographics (such as name, address, or telephone number). The PID may include multiple DFNs; only the DFN from the Sign Up facility is to be retained. The contents of the update should be used to update all other patient information. If application of the update would create a data safety issue, the update is to be rejected.

The ADT-A31[83] is used to update the demographic data. The patient is identified by the ICN in the PID; no other fields of the PID need to be validated for coherence with the current contents of the vendor database. The PID may contain updates for the DFN, SSN, or patient demographics (such as name, address, or telephone number). The PID may include multiple

---

78 If an A24 transaction references two patients in a vendor's database, the request indicates that a merge of the two patients is required; however, the merge may require home visite to reclaim equipment. For this reason a merges must generate an Application Rejection and be handled manually.

79 The vendor's database should be considered unsafe if two patients have the same primary key. The primary keys are

80 The SignUp/Activation and MPI update business rules should preclude this condition from existing in the vendor server database.

81 If an A43 transaction references two patients in a vendor's database, the request indicates that a merge of the two patients is required; however, the merge may require home visite to reclaim equipment. For this reason a merges must generate an Application Rejection and be handled manually.

82 The MPI ceased using the ADT-A08 for update messages in October 2007.

83 The MPI started sending the ADT-A31 for update messages in October 2007.

DFNs; only the DFN from the Sign Up facility is to be retained. The contents of the update should be used to update all other patient information. If application of the update would create a data safety issue, the update is to be rejected.

Any other messages received from the MPI other than the messages dealing with subscription (see section 3.3) are to be silently discarded. If the message requests a accept acknowledgement in MSH-15; an accept message (CA) is to be sent. If the message requests an application acknowledgement in MSH-16, a positive acknowledgement (AA) is to be sent. Discarded messages must be logged as being discarded.

3.4.5.1 Message Format

The HL7 Link Patient Information message (ADT-A24) has five data segments that contain the following information: message identification (MSH), update event (EVN), patient identification (PID), additional demographic information for the patient (PD1), and patient visit information (PV1). The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The EVN segment identifies that the event is a link event (A24). The message contains two PID segments. The first PID segment contains the new identity for the patient. The second PID segment contains the current identity for the patient. The PD1 and PV1 segments do not contain data relevant to Home Telehealth. Table 53 lists the segments in an ADT-A24 message. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 53: Home Telehealth ADT-A24 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
EVN	Event Type	Required	Date and time of change event
PID	Patient Identification	Required	Patient (1) Identification
PD1	Additional Demographics	Optional	(not used by Home Telehealth)
PV1	Patient Visit	Optional	(not used by Home Telehealth)
PID	Patient Identification	Required	Patient (2) Identification
PD1	Additional Demographics	Optional	(not used by Home Telehealth)
PV1	Patient Visit	Optional	(not used by Home Telehealth)
ZPD	VA Specific Patient Information	Optional	(not used by Home Telehealth)

The HL7 update message (ADT-A08) has five data segments that contain the following information: message identification (MSH), update event (EVN), patient identification (PID), additional demographic information for the patient (PD1), and patient visit information (PV1). The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The EVN segment identifies that the event is an update event (A08). The PID contains updated information for the patient. The PD1 and PV1 segments do not contain data relevant to Home Telehealth. Table 54 lists the segment in an ADT-A08 message. The *required*

column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 54: Home Telehealth ADT-A08 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
EVN	Event Type	Optional	(not used by Home Telehealth)
PID	Patient Identification	Required	Patient
PD1	Additional Demographics	Optional	(not used by Home Telehealth)
PV1	Patient Visit	Optional	(not used by Home Telehealth)
PV2	Patient Visit – Additional Information	Optional	(not used by Home Telehealth)
OBX	Observation/Result	Optional	(not used by Home Telehealth)
ZPD	VA Specific Patient Information	Optional	(not used by Home Telehealth)
ZSP	VA Specific Service Period	Optional	(not used by Home Telehealth)
ZEL	VA Specific Patient Eligibility	Optional	(not used by Home Telehealth)
ZCT	VA Specific Emergency Contact	Optional	(not used by Home Telehealth)
ZEM	VA Specific Employment Information	Optional	(not used by Home Telehealth)
ZEF	VA Specific File/Field	Optional	(not used by Home Telehealth)

The HL7 update message (ADT-A31) has five data segments that contain the following information: message identification (MSH), update event (EVN), patient identification (PID), additional demographic information for the patient (PD1), and patient visit information (PV1). The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The EVN segment identifies that the event is an update event (A31). The PID contains updated information for the patient. The PD1 and PV1 segments do not contain data relevant to Home Telehealth. Table 55 lists the segment in an ADT-A31 message. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 55: Home Telehealth ADT-A31 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
EVN	Event Type	Optional	(not used by Home Telehealth)
PID	Patient Identification	Required	Patient
PD1	Additional Demographics	Optional	(not used by Home Telehealth)
NK1	Next of Kin	Optional	(not used by Home Telehealth)
PV1	Patient Visit	Optional	(not used by Home Telehealth)
PV2	Patient Visit – Additional Information	Optional	(not used by Home Telehealth)
OBX	Observation/Result	Optional	(not used by Home Telehealth)

Segment	Name	Required	Contents
ZPD	VA Specific Patient Information	Optional	(not used by Home Telehealth)

The HL7 move message (ADT-A43) has five data segments that contain the following information: message identification (MSH), move event (EVN), patient identification (PID), additional demographic information for the patient (PD1), and patient merge information (MRG). The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The EVN segment identifies that the event is a move event (A43). The PID contains updated information for the patient; the MRG contains the prior information for the patient. The PD1 segment does not contain data relevant to Home Telehealth. Table 57 defines the fields of the MRG segment. Table 56 lists the segment in an ADT-A43 message. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 56: Home Telehealth ADT-A43 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
EVN	Event Type	Optional	(not used by Home Telehealth)
MRG	Merge Information	Required	Identifies patient to be "moved"
PID	Patient Identification	Required	Patient
PD1	Additional Demographics	Optional	(not used by Home Telehealth)

Table 57: VA MRG Segment

Field	Name	Type	Example	VA use or definition
MRG-1	Prior Patient Identifier List	CX		PID-3 prior to change
MRG-2	Prior Alternate Patient ID	CX		(the field is not supported)
MRG-3	Prior Patient Account Number	CX		(the field is not supported)
MRG-4	Prior Patient ID	CX		(the field is not supported)
MRG-5	Prior Visit Number	CX		(the field is not supported)
MRG-6	Prior Alternate Visit Number	CX		(the field is not supported)
MRG-7	Prior Patient Name	XPN		PID-5 prior to change

3.4.5.2 Example

The following example contains five segments. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^) and
- field components are separated by a "tilde" (~).

The update, link, and move messages have many fields and segments that are not of interest to the Home Telehealth vendor server. The fields that are not of interest should be skipped and not processed. The examples were created by the Home Telehealth emulator. The MPI will include other data segments that should be ignored.

```
MSH^~|\&^MPI^200M~TLMPI.FO-BAYPINES.MED.VA.GOV~DNS^HTMPI^200TX~XYZ.MED.VA.GOV~DNS^20051022154448-0500^^
ADT~A24^1920051022154448^T^2.4^^^AL^AL^USA^^^^

PID^1^^2134567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789
~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East We
st Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789
~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East We
st Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^

PD1^^^^^^^^^^^^^^^^^^^^^

PV1^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
```

Figure 21: MPI ICN Update Message

```
MSH^~|\&^MPI^200M~TLMPI.FO-BAYPINES.MED.VA.GOV~DNS^HTMPI^200TX~XYZ.MED.VA.GOV~DNS^20051022154450-0500^^
ADT~A43^2120051022154450^T^2.4^^^AL^AL^USA^^^^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789
~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East We
st Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^

MRG^1234567890v123456~~~USVHA~NI~~~|123456789~~~USVHA~PI~DAYTDEV&552&L~~|123456789~~~USSSA~SS~~~^^^^^^Patie
nt~Veterans~Aloysius~~~~L
```

Figure 22: MPI Authority Update Message

```
MSH^~|\&^MPI^200M~TLMPI.FO-BAYPINES.MED.VA.GOV~DNS^HTMPI^200TX~XYZ.MED.VA.GOV~DNS^20051022154445-0500^^
ADT~A08^1720051022154445^T^2.4^^^AL^AL^USA^^^^

EVN^A08^20020913112211-0500^^A1^12584~REED~DANNY~~~~~~USVHA&&0363~L~~~NI~VA FACILITY NAME&500&L^2002091
3112211-0500^500

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789
~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East We
st Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^
```

Figure 23: MPI Demographics Update Message (A08)

```
MSH^~|\&^MPI^200M~TLMPI.FO-BAYPINES.MED.VA.GOV~DNS^HTMPI^200TX~XYZ.MED.VA.GOV~DNS^20051022154445-0500^^
ADT~A31^1720051022154445^T^2.4^^^AL^AL^USA^^^^

EVN^A31^20020913112211-0500^^A1^12584~REED~DANNY~~~~~~USVHA&&0363~L~~~NI~VA FACILITY NAME&500&L^2002091
3112211-0500^500

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789
~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East We
st Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^
```

Figure 24: MPI Demographics Update Message (A31)

3.4.6 Acknowledge Message Content

The message content is given in the *VA Home Telehealth HL-7 Message formats* document and in section 3.12. The Home Telehealth vendor server generates an acknowledgement when it has processed the update message. The vendor server indicates the acceptance of the notification request in the acknowledgement. Section 3.1.6 contains the general discussion of the commit and application acknowledgement.

3.4.6.1 Message Format

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard.

The HL7 Acknowledge message has three data segments. The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The Message Acknowledgement (MSA) segment identifies the message that is to be acknowledged (positively or negatively). The error (ERR) segment identifies the location of the error, if the acknowledgement indicates that the original message was rejected.

3.4.6.2 Example

The following example is of an acknowledgement that indicates a successful completion of a request. The example was created by the Home Telehealth emulator for the ADT-A08 above.

```
MSH^~|\&^HTMPI^200TX~XYZ.MED.VA.GOV~DNS^MPI^200M~TLMPI.FO-BAYPINES.MED.VA.GOV~DNS^20051022154445-0500^^
ACK~A08^1820051022154445^T^2.4^^^AL^NE^USA^^^^

MSA^AA^1720051022154445^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 25: MPI Update Acceptance (Application Acknowledgement)

3.5 Medical Order[84]

The objective of the medical order function is to establish the operating parameters for a Home Telehealth system. The medical order function is a priority two function. Priority two functions are to be implemented after priority one functions.

[84] The future release of this document will contain a revision to this section.

3.5.1 Description

The medical order function identifies the device, the observations, the measurement limits, the dialogs used during the observation process, and the progress note templates that are used to report on the patient progress.

3.5.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; they are listed in sequential order.

3.5.2.1 User Responsibilities

The care coordinator is the user in the medical order process. The care coordinator enters the request using a VistA menu. The care coordinator selects the patient, the modality, the Home Telehealth vendor server, and replies "yes" to new medical order.

3.5.2.2 VistA Responsibilities

Once the user has completed the medical order request, VistA composes the HL7 medical order message and sends it through the Interface Engine to the appropriate Home Telehealth vendor server. VistA is also responsible maintaining the status of the medical order request and processing the acknowledgement message. VistA should update the patient's record in MPI after the Home Telehealth vendor server has accepted the medical order.

3.5.2.3 Interface Engine Responsibilities

The Interface Engine routes the message from the facility Interface Engine through the Austin Interface Engine to the appropriate Home Telehealth vendor server. The Interface Engine routes Acknowledgement messages originating at the Home Telehealth vendor server to the originating facility.

3.5.2.4 Home Telehealth vendor server Responsibilities

The Home Telehealth vendor server accepts the Medical Order message. After processing the order request, the server sends an acknowledgement message to the originating facility. The server must send an acknowledge message to VistA indicating the acceptance of the order. The acknowledgement message would also be sent to indicate the rejection of the order; in that case, the acknowledge message would contain an error indication and reason.

3.5.2.5 MPI Responsibilities

MPI is not involved in the medical order process.

3.5.2.6 HDR Responsibilities

HDR is not involved in the medical order process.

3.5.3 HT Mandatory Fields

The medical order process requires the following fundamental data items:

- Device
- Requesting facility id
- Requesting facility number
- VISN
- Patient ICN
- Modality
- Vitals observation type with value limits
- Dialog type
- Progress note template type

Table 58: Home Telehealth Vendor Server Medical Order Data Items

Data item	Use	Source
Home Telehealth vendor server identification	Placed in MSH and OBX segments to identify the vendor server and vendor server application	Table 80 and Table 81
Patient ICN	National index for the patient (unique identity within the VA)	PID-3 (Table 14 and Table 15)
Patient Name	Legal name of the patient	PID-5 (Table 13)
Patient SSN	US index for the patient (unique identity within the US)	PID-3 (Table 14 and Table 15)
Patient's local phone number	Contact number for patient	PID-13 (Table 13)
Patient's record number in medical order VistA facility (DFN)	VistA facility index for the patient (unique identity within VistA facility)	PID-3 (Table 14 and Table 15)
Medical order facility number	Identify the source of medical order message and identification of source of indices and names	MSH-4 (Table 6) and various places in PID (Table 13), PD1, and PV1 segments
Medical order facility DNS	Identify the source of medical order message	MSH-4 (Table 6)
Medical order facility id	Identify the source of indices and names	Various locations in PID (Table 13), PD1 (Table 23), and PV1

Data item	Use	Source
		(Table 25) segments
Patient DOB	Aid in the manual resolution of data integrity issues	PID-7 (Table 13)
Consult number	The basis of the Home Telehealth assignment, used to associate a progress note with Home Telehealth	PV1-5 (Table 25)
Care Coordinator name	Person that can modify the patient's data on the vendor server, valid CCOW user	PD1-4 (Table 23)

3.5.4 Data Nomenclature

The facility id, facility number, and VISN table are obtained from the Institution file. The vital sign identifiers and qualifiers are given in section 5.

3.5.5 Message Content

The message format will be supplied later.

3.5.5.1 Message Format

The medical order function uses the General Order (ORM) Message as documented in chapter 4 of the HL7 standard. The event code is O01.

3.5.5.2 Example

(to be supplied)

3.6 Inactivation

A care coordinator may stop or resume the active monitoring of a patient. A suspension may be either temporary or permanent. The sign up process places the patient in the "active" state. The Inactivation function places the patient in an inactive state. While in the inactive state, the patient will not use the home device and the vendor server will not collect Summary of Episode progress note data.

3.6.1 Description

The data in the patient inactivation HL7 message identifies the patient (local and enterprise id), the facility that is providing care, and the care coordinator. In support of the patient inactivation process, Home Telehealth vendors are required to

1. accept the HL7 inactivation message,
2. validate that the patient is currently active,
3. mark the patient as inactive,
4. generate a Summary of Episode progress note (section 3.7) to close out the progress monitoring,
5. stop collected data for future Summary of Episode progress notes, and
6. provide an HL7 application acknowledgement.

The Care Coordinator uses a VistA menu to initiate the inactivation process. The Care Coordinator selects the patient from the list of VistA active patients. The VistA system obtains the national identifier for the patient. The VistA system sends the inactivate message to the appropriate Home Telehealth system. The vendor server accepts the inactivate function for an existing patient only if the patient is active (section 3.1 and Table 79). When a patient is active, the inactivate function suspends the collection of data for the Summary of Episode progress note (section 3.7) and Home Telehealth data for the HDR (section 3.2).

3.6.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; they are listed in sequential order.

3.6.2.1 User Responsibilities

The care coordinator is the user in the inactivation process. The care coordinator enters the request using a VistA menu. The care coordinator selects the patient, the Home Telehealth vendor server, and replies "yes" to new inactivation request.

3.6.2.2 VistA Responsibilities

Once the user has completed the inactivation request, VistA composes the HL7 inactivation message and sends it through the Interface Engine to the appropriate Home Telehealth vendor server. VistA is also responsible maintaining the status of the inactivation request and processing the acknowledgement message. VistA should update the patient's status in the Home Telehealth patient file.

3.6.2.3 Interface Engine Responsibilities

The Interface Engine routes the message from the facility Interface Engine through the Austin Interface Engine to the appropriate Home Telehealth vendor server. The Interface Engine routes Acknowledgement messages originating at the Home Telehealth vendor server to the originating facility.

3.6.2.4 Home Telehealth vendor server Responsibilities

The Home Telehealth vendor server accepts the inactivation message. The patient is identified using the ICN from the inactivation message. If the patient does not exist in the vendor database, the request is to be rejected. The verification rules for the patient identity are given in section C.2. If the verification fails, the request is to be rejected. If the patient is active at the source facility of the inactivation message, the request is to be accepted for processing. If the patient is already inactive, the message is to be acknowledged indicating acceptance of the request without further processing. After processing the inactivation request, the server sends an acknowledgement message to the originating facility. The server must send an acknowledge message to VistA indicating the acceptance of the inactivation. The acknowledgement message would also be sent to indicate the rejection of the inactivation; in that case, the acknowledge message would contain an error indication and reason (Table 79).

3.6.2.5 MPI Responsibilities

MPI is not involved in the inactivation process.

3.6.2.6 HDR Responsibilities

HDR is not involved in the inactivation process.

3.6.3 Required Fields

The inactivation process requires the following fundamental data item:

- Patient ICN

Table 59: Home Telehealth Vendor Server Inactivation Data Items

Data item	Use	Source
Home Telehealth vendor server identification	Placed in MSH and OBX segments to identify the vendor server and vendor server application	Table 80 and Table 81
Patient ICN	National index for the patient (unique identity within the VA)	PID-3 (Table 14 and Table 15)
Patient Name	Legal name of the patient	PID-5 (Table 13)

Data item	Use	Source
Patient SSN	US index for the patient (unique identity within the US)	PID-3 (Table 14 and Table 15)
Patient's record number in sign up VistA facility (DFN)	VistA facility index for the patient (unique identity within VistA facility)	PID-3 (Table 14 and Table 15)
Sign up/inactivation facility number	Identify the source of request and identification of source of indices and names	MSH-4 (Table 6) and various places in PID (Table 13), PD1, and PV1 segments
Sign up/deactivation facility DNS	Identify the source of request	MSH-4 (Table 6)
Sign up/deactivation facility id	Identify the source of indices and names	Various locations in PID (Table 13), PD1 (Table 23), and PV1 (Table 25) segments
Patient DOB	Aid in the manual resolution of data integrity issues	PID-7 (Table 13)
Consult number	The basis of the Home Telehealth assignment, used to associate a progress note with Home Telehealth[85]	PV1-5 (Table 25) from Sign Up message
Care Coordinator name	Person that can modify the patient's data on the vendor server, valid CCOW user	PD1-4 (Table 23) from Sign Up message
Date/Time of event	The official time stamp for the activation	EVN-2 (Table 12)

Integrated patients are identified by ICN. All patients are identified in an HL7 message by the ICN; any HL7 message that does not contain an ICN to identify the patient is to be rejected. A consistency check should be performed on the identified patient in the vendor database; the check verifies that the patient in the request and the identified patient in the vendor database have the same name, SSN, DFN[86], name and DOB using the rules in Table 4. The HL7 standard defines that any comparison between components as a string comparison. If one of the

[85] This linkage will be removed in the future. The consult number will then be optional. A null value will indicate that a consult number was not supplied in the sign up transaction message.

[86] The DFN should be treated as a tuple: local index and facility number. The index portion the DFN is only unique within the assigning facility. All comparisons between two DFNs must include both the index and the facility number. DFN_a and DFN_b are equal if and only if the ID component of DFN_a equals the ID component of DFN_b and the assigning facility of DFN_a equals the assigning facility of DFN_b.

comparison terms is null, then the comparison is considered as valid; otherwise, the comparison of terms is a string comparison (see section 4). The results of the consistency check should be an alert; the results of the consistency check must not be used to determine whether the message is to be processed; a failed consistency check indicates that the vendor patient database may not be coherent with the VA patient database and requires the attention by the support staff. The processing of the message is simply based upon the identification of the patient that is to be inactivated by use of the ICN.

3.6.4 Data Nomenclature

The inactivation type identifies the type and duration of the request.

3.6.5 Message Content

The *VA Home Telehealth HL-7 Message formats* document defines the message content details. The following is a high-level explanation of the fields of primary interest for Home Telehealth. The inactivation function uses the Admission, Discharge, and Transfer (ADT) Message as documented in chapter 3 of the HL7 standard. The event code is A03 (Discharge a Patient). VistA sends the inactivate message to initiate the inactivation function on the Home Telehealth vendor server.

3.6.5.1 Message Format

The inactivation function uses the Admission, Discharge, and Transfer (ADT) Message as documented in chapter 3 of the HL7 standard. The event code A03 (discharge a patient) is used to deactivate the patient. The message has the same format at the Sign Up message (ADT-A04) described in section 3.1.5. The HL7 inactivate message has three data segments that contain the following information: message identification (MSH), inactivate event (EVN), and patient identification (PID). Table 60 lists the segment in an ADT-A03 message. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 60: Home Telehealth ADT-A03 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
EVN	Event Type	Required	Date time of inactivation
PID	Patient Identification	Required	Patient
ROL	Role	Optional	(not used by Home Telehealth)
PD1	Additional Demographics	Optional	(not used by Home Telehealth)
PV1	Patient Visit	Optional	(not used by Home Telehealth)
PV2	Patient Visit – Additional Information	Optional	(not used by Home Telehealth)
DB1	Disability Information	Optional	(not used by Home Telehealth)

Segment	Name	Required	Contents
DG1	Diagnosis Information	Optional	(not used by Home Telehealth)
DRG	Diagnosis Related Group	Optional	(not used by Home Telehealth)
PR1	Procedure	Optional	(not used by Home Telehealth)
OBX	Observation/Result	Optional	(not used by Home Telehealth)
PDA	Patient Death and Autopsy	Optional	(not used by Home Telehealth)

3.6.5.2 Example

The following example contains five segments. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^) and
- field components are separated by a "tilde" (~).

Variable entities are enclosed in "<" and ">"; the actual value is chosen from a table associated with the variable. The Inactivation message has many fields that are not of interest to the Home Telehealth vendor server. The fields that are not of interest should be skipped and not processed. The example was created by the Home Telehealth emulator.

```
MSH^~|\&^DG HOME TELEHEALTH^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS
^20051022154418-0500^^ADT~A03^1320051022154418^T^2.4^^^AL^AL^USA^^^^

EVN^A03^20051022154418-0500^^2^32885~Blankenship~George~~~~~~USVHA&&0363~L~~~NI~FACILITY&STATION&L^200510221
54418-0500^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789
~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~M^19461222^m^^w^1335 East We
st Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^

PD1^^^^33250~Doctor~Fine~~~~~~USVHA~L~~~NI~facility&station&L^^^^^^^^^^^^^^^^

PV1^^^^^123456789~~~USVHA~~DAYTDEV&552&L~~^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
```

Figure 26: Inactivation Request Message

3.6.6 Acknowledge Message Content

The message content is given in the *VA Home Telehealth HL-7 Message formats* document and in section 3.12. Section 3.1.6 contains the general discussion of the commit and application acknowledgement.

The Home Telehealth vendor server generates an acknowledgment message when it has processed the patient Inactivation message. The Home Telehealth vendor server indicates the acceptance of the patient inactivation in the application acknowledgement. An application reject message will be sent for any of the conditions listed in Table 79. In general, the inactivation will be rejected for the following four reasons

1. the PID segment contains invalid data, and
2. acceptance of the inactivate request would create inconsistencies in the vendor database.

3.6.6.1 Message Format

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard and section 3.12.5. The requirement for an acknowledgement is defined in the sign up message (section 3.1.5). The inactivation source will mandate a processing acknowledgement of the inactivate itself (an application acknowledgement).

3.6.6.2 Example

The following three examples are of a message acceptance, a request acceptance (application acknowledge) and a request refusal (application negative acknowledgement). The examples were created by Home Telehealth emulator.

```
MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^DG HOME TELEHEALTH^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS
^20051022154418-0500^^ACK~A03^1320051022154418^T^2.4^^^ER^NE^USA^^^^

MSA^CA^1320051022154418^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 27: Inactivation Message Acceptance (Commit acknowledgement)

```
MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^DG HOME TELEHEALTH^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS
^20051022154418-0500^^ACK~A03^1420051022154418^T^2.4^^^AL^NE^USA^^^^

MSA^AA^1320051022154418^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 28: Inactivation Request Acceptance (Application Acknowledge)

```
MSH^~|\&^HDRVTLS^200TX~XYZ.MED.VA.GOV~DNS^DG HOME TELEHEALTH^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS
^20051022154418-0500^^ACK~A03^1420051022154418^T^2.4^^^AL^NE^USA^^^^

MSA^AR^1320051022154418^^^^100~Missing ICN~HL70357

ERR^PID~3~0~100&Missing ICN&HL70357
```

Figure 29: Inactivation Request Refusal (Application Acknowledge)

3.7 Progress Notes

The Home Telehealth vendor server transfers selected patient status information to VistA. The information is placed into a template for a text note that is stored in the VistA patient record. The status information is placed in a standard VA progress note for distribution to appropriate individuals. The data is sent in an HL7 message documented in chapter nine of the HL7 2.4 standard. Chapter 9 defines messages to support *Medical Records/Information Management (Document Management).*

3.7.1 Description

There are two types of progress notes. One is the report of an "out-of-bounds" observation and the second is a "Summary of Episode"[87] progress report. The Home Telehealth vendor server generates the data used by VistA to build a draft note and identifies the note title. After VistA builds the draft, it is queued for signature by the care coordinator.

3.7.1.1 Summary of Episode Progress Note

The Home Telehealth vendor server sends a Summary of Episode progress note template each month after the signup/activation of a patient. A Summary of Episode note is to be created for each patient every month; the patient should receive just one note per month except (perhaps) for the last month that the patient is in the program. The note is generated at midnight and covers the period that ends at midnight. The note is to be sent on the monthly anniversary of the patient's birth. The last day of the month is to be used as the note generation date for all birth dates that do not occur in the current month; for example, a patient born on January 31 will have a Summary of Episode note generated on January 31, February 28 (or 29), March 31, April 30, May 31, June 30, July 31, August 31, September 30, October 31, November 30, and December 31. If a patient is activated after the anniversary day, the note should be generated on the last day of the month. The vendor server is also to generate a Summary of Episode progress note when a patient is inactivated, if one has not already been generated for the month. The first line of the note summarizes the reporting period of the note. The note template contains a set of "lines" for the patient monitored by the vendor server. An individual "line" gives the number of DMP sessions or measurement observations that processed during the collection period. Figure 30 contains the line used in the progress note template for patients that submitted data during the period. The pertinent data for the patient from the HL7 message is used to fill the italicized fields. Figure 33 contains the line used in the progress note template for patients that did not submit data during the period. The Summary of Episode progress note is used to update the care provider with the patient participation and track the time spent by the care coordinator for each Home Telehealth patient. The formal name for the Summary of Episode progress note is given in Table 91.

[87] This note was previously known as the "28-day" note. All references to the note will be using it formal name, "Summary of Episode".

<patient name> is enrolled in the Care Coordination Home Telehealth program (CCHT) and continues to be monitored via home telehealth equipment for <category of care indicator>88. The daily data sent by the patient is reviewed by the Care Coordination staff, who communicates abnormal results with the primary care team, or other healthcare provider, as appropriate. Disease management education specific for the patient is provided on an ongoing basis.

<patient name> has been supported by Home Telehealth Program vendor <vendor name> from <start date of reporting period> to <end date of reporting period>

The following information was submitted by the veteran their Home Telehealth system.

Figure 30: Summary of Episode Progress Note Reporting Period Line

<number> <observation> observations

Figure 31: Summary of Episode Progress Note Reporting Line (Measurement)

- <number> sessions with <DMP name> disease management protocol

Figure 32: Summary of Episode Progress Note Reporting Line (DMP or Dialog)

- no data was collected during the reporting period

Figure 33: Summary of Episode Progress Note Reporting Line (no data)

3.7.1.2 "Out-of-bounds" Progress Note

The "out-of-bounds" note is generated as part of an alert reconciliation process used by a care coordinator. The business approach defines that a care coordinator must reconcile the alerts signaled by the vendor server and may request that the vender server generate a draft progress note that is to be sent to VistA. Once received at VistA, the draft note may be edited by the care coordinator, but must be approved by the care coordinator; it is then forwarded to the clinical team that provides care for the patient. The vendor server sends the draft note in an HL7 message. Figure 35 contains sample text to be used in the draft progress note sent to VistA. The line "*An alert condition was detected on*" contains the date and time of the alert. The date and time should be the same as the observation set time stamp placed in an ORU message (OBR-7) for any data included in the progress note. The <*time of alert*> portion of the line must include a UTC time offset. The line "*PARAMETER OUT-OF-BOUNDS*" is used to report a vital sign that created an alert. The name and value must be the same as reported in an observation (see 3.2). If there are no vital signs with an out-of-bounds value, the line "*PARAMETER OUT-OF-BOUNDS*" should not be present. All vital signs with out-of-bound conditions that are received during a collection session should be reported in a single draft progress note. The lines "*DIALOG QUESTION*" and "*PATIENT RESPONSE*" are used to report a question that created an alert. This dialog question number and text must be as presented to the patient. The response is the exact response of the patient. If there are no dialog questions with an out-of-bounds value, the lines "*DIALOG QUESTION*" and "*PATIENT RESPONSE*" should not be present. All dialog questions with out-of-bound conditions that are received during a collection session should be

[88] The category of care indicators are defined in *Home Telehealth Census Reporting* document.

reported in a single draft progress note. The "*COMMENTS*" is an optional free form area that contains text added by the care coordinator during the processing of the alert. The note is to contain all data collected during a collection session as defined by the OBR-7 field (see Table 35) for any data that was sent in an ORU-R01. The following paragraphs discuss the creation of the text body of the draft note. The vendor is free to add text information that the care coordination team might require.

<vendor> currently supports <last name>, <first name> <middle initial>.

An alert condition was detected on <date of alert> at <time of alert>

PARAMETER OUT-OF-BOUNDS: <vital sign name>=<vital sign value>

DIALOG QUESTION #<question number> <text>

PATIENT RESPONSE <text>

COMMENTS :

Figure 34: "Out-Of-Bounds" Progress Note Alert Lines

The following defines the actions by the vendor server when a care coordinator responds to an alert condition. The assumption is that the vendor server performs an analysis of the collected vital signs and dialog responses directed by parameters set by the care coordinator. The result of the analysis is alert flags that are placed in the patient record on the vendor server. The care coordinator would normally reconcile the alerts by taking a specific action, such as clinking on a button in the vendor viewer to invoke a reconciliation screen. On the reconciliation screen, the care coordinator is able to add notes to the patient's record and perform other actions peculiar to the vendor system. The care coordinator must also be able to direct the vendor system to generate a Draft Out-of-Bounds Progress Note to be sent to the VistA system where the patient is registered. If the care coordinator requests that a draft progress note be generated, the vendor system must display the draft note text in an editable window. The Care Coordinator should be able to edit and add to the note's content. The Care Coordinator will direct the vendor system to send the message to the VistA system by taking specific steps, such as clinking on a Send button. If the care coordinator does not elect to send the note, it should be discarded. The title of this Draft Progress note is *Care Coordination Home Telehealth Subsequent Evaluation*. An example is given in Figure 35.

<vendor> currently supports Patient, Veterans Aloysius.

An alert condition was detected on 12/11/2006 at 11:51 (Eastern)89

PARAMETER OUT-OF-BOUNDS: BLOOD PRESSURE=180/80

PARAMETER OUT-OF-BOUNDS: TEMPERATURE=102.3

Dialog question #4 <dialog text>

Patient response <patient text>

Dialog question #6 <dialog text>

Patient response <patient text>

COMMENTS <care coordinator text>

Figure 35: Sample "Out-Of-Bounds" Progress Note Body

3.7.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; they are listed in sequential order.

3.7.2.1 Home Telehealth vendor server Responsibilities

The Home Telehealth vendor server will automatically generate the profile information that is used to create a progress note.

The Summary of Episode progress note contains the required historical data. The note is only sent while the patient is active. The first note is generated on the first monthly anniversary of the patient's birth (see section 3.7.1.1) after a Sign Up message activates the patient and then every month thereafter on the anniversary of the patient's birth. The last note is generated when the vendor server receives an inactivate message.

The "out-of-bounds" profile information identifies the vitals observation that is not within prescribed tolerance or some other alert condition. The server sends the information to VistA via HL7.

3.7.2.2 Interface Engine Responsibilities

The Interface Engine routes the message from the Home Telehealth vendor server through the Austin Interface Engine to the appropriate facility Interface Engine. The Interface Engine routes Acknowledgement messages originating at the VistA facility to the Home Telehealth vendor server.

89 The UTC offset my expressed as string such as "Eastern" or numeric value such as "-5", "-5:00", or "-0500".

3.7.2.3 VistA Responsibilities

The VistA system processes the progress note information received from the vendor server and generates an acknowledgement to the Home Telehealth vendor server. The acknowledgement indicates the acceptance of the progress note information. The VistA system creates a draft progress note for the care coordinator. The care coordinator will sign the note and allow the note to seen by the clinical team and, in the case of the Summary of Episode progress note, by DSS.

3.7.2.4 User Responsibilities

The user is the care coordinator and is the recipient of the draft progress note. The user must validate the draft note and create a signed progress note.

3.7.2.5 MPI Responsibilities

MPI is not involved in the progress note profile processing.

3.7.2.6 HDR Responsibilities

HDR is not involved in the progress note profile processing.

3.7.3 Required Fields

The report contains the fundamental data items defined in Table 61.

Table 61: Home Telehealth Vendor Server Progress Note Data Items

Data item	Note	Use	Source
Home Telehealth vendor server identification	All	Placed in MSH and OBX segments to identify the vendor server and vendor server application	Table 80 and Table 81
Patient ICN	All	National index for the patient (unique identity within the VA)	PID-3 (Table 14 and Table 15)
Patient Name	All	Legal name of the patient	PID-5 (Table 13)
Patient SSN	All	US index for the patient (unique identity within the US)	PID-3 (Table 14 and Table 15)
Patient's record number in sign up VistA facility (DFN)	All	VistA facility index for the patient (unique identity within VistA facility)	PID-3 (Table 14 and Table 15)
Clinic name	Summary of Episode	Identifies the clinic that is treating the patient	PV1-3 (Table 25)
Consult number	All	The basis of the Home Telehealth assignment, used to	PV1-5 (Table 25)

Data item	Note	Use	Source
		associate a progress note with Home Telehealth[90]	
Care Coordinator name	All	Person that can modify the patient's data on the vendor server, valid CCOW user	PD1-4 (Table 23)
Document information	All	Document name, creation date of the document, and other information	TXA (Table 63)
Observation identity	All	Identifies the observation that was collected	OBR-4/OBX-3
Count of observations	Summary of Episode	Count of observations collected during the period	OBX-5
Observation value	Alert	Out-of-bounds observation	OBX-5
Collection period (start)	Summary of Episode	Start of the collection period	PV1-44
Collection period (stop)	Summary of Episode	End of the collection period	PV1-45
Observation date	Alert	Date and time of "out-of-bounds" value	OBX-14

3.7.4 Data Nomenclature

The data in the progress notes identifies the consult that qualified the patient for Home Telehealth and the vital summary or problem observation.

3.7.5 Message Content

The progress note data is defined in the HL7 2.4 standard chapter 9 (*Medical Records/Information Management (Document Management*).

3.7.5.1 Message Format

The observation function uses the Medical Document Management (MDM) Message as documented in chapter 9 of the HL7 standard. The event code is T02. The T02 event identifies

[90] This linkage will be removed in the future. The consult number will then be optional. A null value will indicate that a consult number was not supplied in the sign up transaction message.

the message as carrying an "original document and content". The HL7 document notification message has six data segments that contain the following information: message identification (MSH), document available event (EVN), patient identification (PID), patient visit information (PV1), document notification (TXA), and observation/result data. The message has a variable number of data segments. The message can carry a variable sized document containing distinct lines in the OBX segment. Table 62 lists the segment in an MDM-T02 message. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 62: Home Telehealth Progress Note MDM-T02 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
EVN	Event Type	Required	Date and time of progress note generating event
PID	Patient Identification	Required	Patient
PV1	Patient Visit	Required	Treating clinic name
TXA	Document Notification	Required	Identifies the progress note to be built
OBX	Observation/Result	Required	Progress note contents

The primary items of interest in the MSH segment (Table 6) are the identities of the Home Telehealth Vendor application/server, the VistA TIU application/server, the message type, and the acknowledgement requirements. The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The content of the EVN segment identifies the event as an original document notification (T02).

The items of interest in the PID data segment (Table 13) are the patient VA identity (record number or key in a VA system database), patient identity facility id (system that hosts the patients demographics database), and the ICN identifying the patient. The VA sign up facility identity (DFN), and the VA national identity (ICN), the US national identity (SSN) for the patient are given to the Home Telehealth vendor server in the patient sign up request (section 3.1).

The item of interest in the PV1 data segment (Table 25) is the treating clinic name (Table 92). The VistA system will generate a new visit to the clinic. The new visit will be associated with the note.

The transcription document header (TXA) segment defines the document type and the individual that is to be notified of the document generation and required completion. Table 63 defines the TXA segment.

Table 63: VA TXA Segment

Field	Name	Type	Example	VA use or definition
TXA-1	Set ID	SI		
TXA-2	Document Type	IS		(Home Telehealth does not use this field)

Field	Name	Type	Example	VA use or definition
TXA-3	Document Content Presentation	ID	TEXT	HL7 table 0191
TXA-4	Activity Date/Time	TS	200411280622200000-0400	Date and time of note creation
TXA-5	Primary Activity provider Code/Name	XCN		(Home Telehealth does not use this field)
TXA-6	Origination Date/Time	TS	200411280622200000-0400	Date and time of note creation
TXA-7	Transcription Date/Time	TS		(Home Telehealth does not use this field)
TXA-8	Edit Date/Time	TS		(the field is not supported)
TXA-9	Originator Code/Name	XCN	(Care Coordinator)	(PD1-4 from sign up message)
TXA-10	Assigned Document Authenticator	XCN		(Home Telehealth does not use this field)
TXA-11	Transcriptionist Code/Name	XCN		(the field is not supported)
TXA-12	Unique Document Number	EI	(consult number)[91]	(PV1-5.1 from sign up message)
TXA13	Parent Document Number	EI		(Home Telehealth does not use this field)
TXA-14	Placer Order Number	EI		(the field is not supported)
TXA-15	Filler Order Number	EI		(OBR-3 from observation for "out-of-bounds" progress note not used for Summary of

[91] This linkage will be removed in the future. The consult number will then be optional. A null value will indicate that a consult number was not supplied in the sign up transaction message.

Field	Name	Type	Example	VA use or definition
				Episode progress note
TXA-16	Unique Document File Name	ST	(standard note name)	(Table 91)
TXA-17	Document Completion Status	ID	PA	Pre-authenticated HL7 table 0271
TXA-18	Document Confidentiality Status	ID		(Home Telehealth does not use this field)
TXA-19	Document Availability Status	ID	[92]	HL7 table 0273
TXA-20	Document Storage Status	ID		(Home Telehealth does not use this field)
TXA-21	Document Change Reason	ST		(the field is not supported)
TXA-22	Authentication Person, Time Stamp	PPN		(the field is not supported)
TXA-23	Distributed Copies	XCN		(the field is not supported)

Table 64: VA Unique Document Number in TXA--12 (HL7 EI Data Type)

Component	Name	Type	Value
TXA-12.1	Entity Identifier	ST	Consult number from PV1-5.1
TXA-12.2	Namespace ID	IS	USVHA
TXA-12.3	Universal ID	ST	(the component is not supported)
TXA-12.4	Universal ID Type	ID	(the component is not supported)

The observation (OBX) segment identifies the text that is to be placed in the draft progress note. The information for the observation is given in Table 39. The Summary of Episode progress note and the out-of bounds note use a single OBX segment to contain the text of the note. The *Observation Value* field (OBX-5) contains the individual lines of the progress note using a repeated field to contain the whole note. The OBX-5 field of the note is a repeated field containing text. Each repeated entry is a distinct line of text for the note.

[92] This field must be blank so that the proper note type is created.

The Summary of Episode progress note is a summary of the activity during the Summary of Episode period. The note has three distinct sections: header, disease management dialog summary, and vital sign observation collection summary. Figure 36 contains the text lines for the note header. Each note is to have the header. The note is to have one disease management dialog summary line (Figure 37) for each dialog that the patient is using. The note is to have one observation summary line (Figure 38) for type of observation that the patient is to submit.

<patient name>[93] is enrolled in the Care Coordination Home Telehealth program (CCHT) and continues to be monitored via home telehealth equipment for <level of care> . The daily data sent by the patient is reviewed by the Care Coordination staff, who communicates abnormal results with the primary care team, or other healthcare provider, as appropriate. Disease management education specific for the patient is provided on an ongoing basis.

<patient name> has been supported by the Home Telehealth Program vendor <vendor name>[94] for <prior progress note date> to <current date>[95].

The following information was submitted by the veteran through the Home Telehealth system.

Figure 36: Summary of Episode Progress Note Header

- <count>[96] sessions with CHF disease management protocol

Figure 37: Summary of Episode Progress Note DMP Summary Line[97]

- <count> [98]<observation name>[99] observations

Figure 38: Summary of Episode Progress Note Measurement Summary Line[100]

The "out-of-bounds" progress note contains a set of free form text lines.

3.7.5.2 Example

Figure 39 is an example of a Summary of Episode progress note. Figure 40 is an example of an "out-of-bounds" progress note. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^) and
- field components are separated by a "tilde" (~).

93 <patient name> is the patient's name in the form <last name>, <first name> from the PID contained in the message.

94 <vendor name> is from Table 82

95 The notes are to be issued on the monthly anniversary of the patient's birth.

96 <count> is the number of disease management dialog sessions

97 The DMP line should only be present if the patient is assigned a DMP

98 <count> is the number of observations collected

99 <observation name> is the name of the vital sign or laboratory measurement collected.

100 There should be one measurement line for each measurement that the patient is assigned to submit.

Variable entities are enclosed in "<" and ">"; the actual value is chosen from a table associated with the variable. The Home Telehealth vendor server must generate all mandatory fields. The examples were created by Home Telehealth emulator.

```
MSH^~|\&^HTAPPL^200TX~XYZ.MED.VA.GOV~DNS^TIUHL7^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20051022154424-05
00^^MDM~T02^1520051022154424^T^2.4^^^AL^AL^USA^^^^

EVN^T02^20051022154424-0500^^2^32885~Blankenship~George~~~~~~~USVHA&&0363~L~~~NI~FACILITY&STATION&L^2005102215
4424-0500^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789
~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~~M^19461222^m^^w^1335 East We
st Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^

PV1^^^CCHT NON VIDEO MONITOR REVIEW~~~~~~C^^123456789~~~USVHA~~DAYTDEV&552&L~~^^^^^^^^^^^^^^^NEW^^^^^^^^^
^^^^^^^^^^^^^^^^^^^^^^^^

TXA^^PR^TEXT^20051022154424-0500^^20051022154424-0500^^^33250~Doctor~Fine~~~~~~~~~~~~facility&station&L^33250~Doctor~Fi
ne~~~~~~~~~~~~facility&station&L^^123456789~USVHA^^^220051022154424~HT^CARE COORDINATION HOME TELEHEALTH SUM
MARY OF EPISODE NOTE ^PA^U^^AC^end of collection period^^

OBX^1^TX^^^Patient, Veterans Aloysius is enrolled in the Care Coordination Home Telehealth program (CCHT) and continues to be monitored
via home telehealth equipment for NON-INSTITUTIONAL CARE. The daily data sent by the patient is reviewed by the Care Coordination
staff, who communicates abnormal results with the primary care team, or other healthcare provider, as appropriate. Disease management
education specific for the patient is provided on an ongoing basis.| Patient, Veterans Aloysius has been supported by the Home Telehealth
Program vendor Emulator from 1/4/2009 to 2/4/2009.|The following information was submitted by the veteran through their Home Telehealth
system.| - 28 sessions with CHF disease management protocol| - 28 sessions with DM disease management protocol| - 28 BLOOD PRESSURE
observations| - 28 PAIN observations| - 28 PULSE observations| - 28 PULSE OXIMETRY observations| - 28 TEMPERATURE observations|
- 28 BLOOD GLUCOSE observations| - 28 WEIGHT observations^^^^^^^^^^^^^^
```

Figure 39: Summary of Episode Progress Note Data

```
MSH^~|\&^HTAPPL^200TX~XYZ.MED.VA.GOV~DNS^TIUHL7^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20051022154424-05
00^^MDM~T02^2520051022154424^T^2.4^^^AL^AL^USA^^^^

EVN^T02^20051022154424-0500^^2^32885~Blankenship~George~~~~~~~USVHA&&0363~L~~~NI~FACILITY&STATION&L^2005102215
4424-0500^

PID^1^^1234567890v123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789
~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~aloysius~~~~L^Government~~~~~~~M^19461222^m^^w^1335 East We
st Highway~~Silver Sprung~MD~20910^^(301) 734-0400^(301) 734-0227^^M^C^^^^^American^^^^^veteran^^^N^

PV1^^^CCHT NON VIDEO INTERVENTION ~~~~~C^^123456789~~~USVHA~~DAYTDEV&552&L~~^^^^^^^^^^^^^^^NEW^^^^^^^^^^
^^^^^^^^^^^^^^^^^^^^^^^^

TXA^^PR^TEXT^20051022154424-0500^^20051022154424-0500^^^33250~Doctor~Fine~~~~~~~~~~~~facility&station&L^33250~Doctor~Fi
ne~~~~~~~~~~~~facility&station&L^^123456789~USVHA^^^220051022154424~HT^CARE COORDINATION HOME TELEHEALTH SUBS
EQUENT EVAL NOTE^PA^U^^AC^end of collection period^^

OBX^1^TX^^^Patient, Veterans Aloysius has been supported by the Home Telehealth vendor Emulator from 10/22/2005 to 10/22/2005.|The pati
ent had an out-of-bounds condition … ^^^^^^^^^^^^^^
```

Figure 40: "Out-of-bounds" Progress Note Data (Pulse)

3.7.6 Acknowledge Message Content

The message content is given in the *VA Home Telehealth HL-7 Message formats* document and in section 3.12. The VistA system generates an acknowledgment message when it has processed the progress note message. Section 3.1.6 contains the general discussion of the commit and application acknowledgement.

3.7.6.1 Message Format

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard and section 3.12.5. The Home Telehealth Vendor Server will mandate an acceptance of the progress note itself (an application acknowledgement).

3.7.6.2 Example

The following three examples are of a message acceptance, a request acceptance (application acknowledge) and a request refusal (application negative acknowledgement). The examples were created by Home Telehealth emulator.

```
MSH^~|\&^TIUHL7^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^HTAPPL^200TX~XYZ.MED.VA.GOV~DNS^20051022154425-05
00^^ACK~T02^1520051022154425^T^2.4^^^ER^NE^USA^^^^

MSA^CA^1520051022154424^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 41: Progress Note Message Acceptance (Commit acknowledgement)

```
MSH^~|\&^TIUHL7^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^HTAPPL^200TX~XYZ.MED.VA.GOV~DNS^20051022154425-05
00^^ACK~T02^1620051022154425^T^2.4^^^AL^NE^USA^^^^

MSA^AA^1520051022154424^^^^

ERR^~0.000000~0.000000~0&Message accepted
```

Figure 42: Progress Note Acceptance (Application Acknowledge)

```
MSH^~|\&^TIUHL7^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^HTAPPL^200TX~XYZ.MED.VA.GOV~DNS^20051022154425-05
00^^ACK~T02^1620051022154425^T^2.4^^^AL^NE^USA^^^^

MSA^AR^1520051022154424^^^^100~Missing ICN~HL70357

ERR^PID~3~0~100&Missing ICN&HL70357
```

Figure 43: Progress Note Refusal (Application Acknowledge)

3.8 Patient Census Submission

Each Home Telehealth vendor server submits a weekly patient census to the Home Telehealth patient census tracking system. The census information is encoded in XML. The XML is sent in an HL7 message without modification except for the use of the standard HL7 escape sequences to allow for special characters. The XML resides in an OBX segment as text string. The data is sent in an HL7 message documented in chapter nine of the HL7 2.4 standard. Chapter 9 defines messages to support *Medical Records/Information Management (Document Management)*.

3.8.1 Description

The vendor must send the census submission every week and covers the period of Monday through Sunday; the submission is expected on Monday following the reporting period. The requirements for the census submission is specified in a separate document listed in the references section (section 8). The format of the HL7 message is very similar to the format used for a progress note (section 3.7).

3.8.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; they are listed in sequential order.

3.8.2.1 Home Telehealth vendor server Responsibilities

The Home Telehealth vendor server will automatically generate the XML file that is used to create a weekly patient census. The patient census is sent every week identifying every patient that has been actively enrolled in the Home Telehealth program sometime during the week.

3.8.2.2 Interface Engine Responsibilities

The Interface Engine routes the message from the Home Telehealth vendor server through the Austin Interface Engine to the appropriate facility Interface Engine servicing the Home Telehealth census database. The Interface Engine routes Acknowledgement messages originating at the Home Telehealth census database to the Home Telehealth vendor server.

3.8.2.3 Home Telehealth Patient Census Database Responsibilities

The Home Telehealth patient census database system processes the patient census information received from the vendor server and generates an acknowledgement to the Home Telehealth vendor server. The acknowledgement indicates the acceptance of the patient census information. The census database system updates the Home Telehealth census database.

3.8.2.4 User Responsibilities

There is no user involved in the weekly census submission processing.

3.8.2.5 MPI Responsibilities

MPI is not involved in the patient weekly census submission processing.

3.8.2.6 HDR Responsibilities

In the future the HDR will assume the processing responsibility of the weekly census submission. The Home Telehealth Census Database will continue generating the census reports.

3.8.3 Required Fields

The patient census message contains the fundamental data items defined in Table 61.

Table 65: Home Telehealth Vendor Server Patient Census Items

Data item	Note	Use	Source
Home Telehealth vendor server identification	All	Placed in MSH and OBX segments to identify the vendor server and vendor server application	Table 80 and Table 81

3.8.4 Data Nomenclature

The data in the XML file of the patient census is defined in the master patient census document (section 8).

3.8.5 Message Content

The patient census HL7 formatted data is defined in the HL7 2.4 standard chapter 9 (*Medical Records/Information Management (Document Management*).

3.8.5.1 Message Format

The patient census function uses the Medical Document Management (MDM) Message as documented in chapter 9 of the HL7 standard. The event code is T02. The T02 event identifies the message as carrying an "original document and content". The HL7 document notification message has three data segments that contain the following information: message identification (MSH), document available event (EVN), and observation/result data. Table 66 lists the segment in an MDM-T02 message for patient census. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 66: Home Telehealth MDM-T02 Segments (Patient Census)

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
EVN	Event Type	Required	Date and time of patient census file creation
OBX	Observation/Result	Required	Patient census XML file contents

The primary items of interest in the MSH segment (Table 6) are the identities of the Home Telehealth Vendor application/server, the Home Telehealth census database application/server, the message type, and the acknowledgement requirements. The content of the MSH segment is

defined in section 3.1.5.1; the MSH is common to all HL7 messages. The content of the EVN segment identifies the event as an original document notification (T02).

The observation (OBX) segment contains the text of the XML file. The information that is contained in the XML file is defined in Appendix H of this document. The weekly patient census submission uses a single OBX segment. The *Observation Identifier* field (OBX-3) defines the XML file version and the XML element definition version (Table 67). The *Observation Value* field (OBX-5) contains the complete text of the XML file in a single field.

Table 67: Census Submission Identifier in OBX-3 (HL7 CE Data Type)

Component	Name	Type	Value
OBX-3.1	Identifier	ST	XML Version
OBX-3.2	Text	ST	Census Specification Version
OBX-3.3	Name of Coding System	IS	CENSUS
OBX-3.4	Alternate Identifier	ST	(the component is not supported)
OBX-3.5	Alternate Text	ST	(the component is not supported)
OBX-3.6	Name of Alternate Coding System	IS	(the component is not supported)

3.8.5.2 Example

Figure 39 is an example of a weekly patient census. The OBX segment contains only a fragment of the XML file and is truncated. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^) and
- field components are separated by a "tilde" (~).

Variable entities are enclosed in "<" and ">"; the actual value is chosen from a table associated with the variable. The Home Telehealth vendor server must generate all mandatory fields. The examples were created by Home Telehealth emulator.

MSH^~|\&^HTAPPL^200Tx~VAWW.emulator.CC.MED.VA.GOV~DNS^HT CENSUS^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^20060105160525-0500^^MDM~T02^320060105160525^T^2.4^^^AL^AL^USA^^^^

EVN^T02^20060105160525-0500^^2^32885~Blankenship~George~~~~~~USVHA&&0363~L~~~NI~FACILITY&STATION&L^20060105160525-0500^

OBX^1^TX^1.0~2.0~CENSUS^^<HTCensus><Table><version>1</version><vendor_number>200Tx</vendor_number><vendor_name>Viterion</vendor_name><date_submitted>2006-01-01T00:00:15-0600</date_submitted><report_start_date>2005-12-25</report_start_date><report_end_date>2005-12-31</report_end_date><Table><patient_ssn>000000132</patient_ssn><patient_icn></patient_icn><vendor_mrn>2002851</vendor_mrn><home_dev_model>V100</home_dev_model><home_dev_serial>2002689</home_dev_serial><name_first>Eileen</name_first><name_mi></name_mi><name_last>Zdemo</name_last><patient_dob>1950-05-01</patient_dob><enrollment_date>2005-12-15</enrollment_date><disenrollment_date></disenrollment_date><activation_date>2005-12-15</activation_date><inactivation_date></inactivation_date><facility_number>673</facility_number><compliance></compliance><program_name></program_name><Table><modality>Dialogue</modality><modality_name>CHF Diabetes Weight</modality_name></Table><Table><modality>Measurement</modality><modality_name>Blood Pressure</modality_name><modality_name>Blood Pressure Pulse</modality_name><modality_name>Blood Sugar</modality_name><modality_name>Weight</modality_name></Table></Table><Table><patient_ssn>000001776</patient_ssn><patient_icn></patient_icn><vendor_mrn>2002774</vendor_mrn><home_dev_model>V500</home_dev_model><home_dev_serial>836</home_dev_serial><name_first>Captain</name_first><name_mi></name_mi><name_last>ZZAmerica</name_last><patient_dob>1945-03-01</patient_dob><enrollment_date>2005-12-02</enrollment_date><disenrollment_date></disenrollment_date><activation_date>2005-12-02</activation_date><inactivation_date></inactivation_date><facility_number>660</facility_number><compliance></compliance><program_name></program_name><raw message precedes

Figure 44: Weekly Patient Census

3.8.6 Acknowledge Message Content

The message content is given in the *VA Home Telehealth HL-7 Message formats* document and in section 3.12. The Home Telehealth census database system generates an acknowledgment message when it has processed the weekly patient census submission. Section 3.1.6 contains the general discussion of the commit and application acknowledgement.

3.8.6.1 Message Format

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard and section 3.12.5 of this document. The Home Telehealth Vendor Server will mandate an acceptance of the week patient census message itself and an application acknowledgement that indicates successful or unsuccessful processing of the submission.

3.8.6.2 Example

The following three examples are of a message acceptance, a submission acceptance (application acknowledge) and a submission refusal (application negative acknowledgement). The error information in a submission refusal is defined in the census requirements document. The examples were created by the Home Telehealth census database server and received by Home Telehealth emulator.

```
MSH|^~\&|HT CENSUS|552|HTAPPL|200T5|||ACK|A120060105154507|P|2.4|||||||
MSA|CA|120060105154507|||||
ERR|^0.000000^0.000000^0&Message accepted
```

Figure 45: Weekly Patient Census Message Acceptance (Commit acknowledgement)

```
MSH|^~\&|HT CENSUS|552|HTAPPL|200T5|||ACK|A120060105154507|P|2.4|||||||
MSA|AA|120060105154507|||||
ERR|^0.000000^0.000000^0&Message accepted
```

Figure 46: Weekly Patient Census Acceptance (Application Acknowledge)

```
MSH|^~\&|HT CENSUS|552|HTAPPL|200T5|||ACK|A120060105154507|P|2.4|||||||
MSA|AA|120060105154507|||||
ERR|OBX^5.000000^0.000000^0&reason for rejection of XML content
```

Figure 47: Weekly Patient Census Refusal (Application Acknowledge)

The error identification codes for the Census submission are given in Table 68.

Table 68: Home Telehealth Census Submission Error Identifier/Text

Identifier[101]	Text
1	Duplicate census report for the week of <start date> to <end date> was previously submitted
2	Report end date '<end date>' is not valid
3	No closing tag present. Message may have been truncated.
4	Required field (<XML tag>) missing from weekly census report
5	Error: No enrollment_date found in record: <vendor MRN>
6	Invalid Level Of Care '<value>' specified for patient with vendor mrn of '{1}'
7	Invalid Level Of Care Affirmed '<value>' specified for patient with vendor_mrn of 'vendor MRN'
8	Level of care tag found without data for patient with vendor_mrn of '<vendor MRN>'
9	Level of care tag not specified for patient with vendor_mrn of '<vendor MRN>'
10	Invalid or missing SSN specified for patient with vendor_mrn of '<vendor MRN>'
11	Patient record with no vendor_mrn found
12	Unable to find facility number '<VA facility number>' in Facilities table for patient with vendor_mrn of '<vendor MRN>'
13	Unable to find modality <modaility identifier> for patient with vendor_mrn '<vendor MRN>'
14	Unable to locate vendor_number '{<vendor MRN>}'
15	Duplicate found. Patient with vendor_mrn '<vendor MRN>' was previously reported with mrn of '<vendor MRN>'
16	A total of <count> patients with following vendor mrns have no disenrollment date and were either 1) reported last week but dropped from this week's report, 2) reported but not with same facility, 3) reported but not with same enrollment start date, or 4) reported multiple open enrollments at same facility.

[101] Error identification code in ERR segment (Table 77).

3.9 Patient DMP Responses

The Home Telehealth vendor server transfers patient Disease Management Protocol (DMP) responses daily as patients respond to the VHA standardized DMP programs. The DMP response information is encoded in XML. The XML is sent in an HL7 message without modification except for the use of the standard HL7 escape sequences to allow for special characters. The XML resides in an OBX segment as text string. The HL7 message documented in chapter nine of the HL7 2.4 standard; chapter 9 defines messages to support *Medical Records/Information Management (Document Management)*.

3.9.1 Description

The vendor must send DMP responses whenever a patient responds to a VHA standardized DMP questionnaire presented on the home unit or presented through IVR. The DMP responses are to be sent by from the vendor servers on a timely and continuous basis. The HL7 requirements for the DMP response are outlined below and the XML layout is specified in greater detail in Appendix I. The format of the DMP HL7 message is very similar to the format used for a progress note (section 3.7), the weekly census report (section 3.8) and the patient survey response (section 3.10).

3.9.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; they are listed in sequential order.

3.9.2.1 Home Telehealth Vendor Server Responsibilities

The Home Telehealth vendor server initiates the HL7 message sequence that submits a patient's DMP response to the HDR. A DMP response is sent whenever a patient responds to a VHA standardized DMP presented on the home unit or presented through IVR. The Home Telehealth vendor server places the DMP patient response information, encoded in XML and embedded as a text string in an OBX segment. The responses can be sent with or without the triage scoring. The Home Telehealth vendor server is responsible for successful delivery of the HL7 message sequence containing the patient's DMP response to the HDR. The vendor system will request both an acceptance acknowledgement and an application acknowledgement as defined in Table 11. The vendor system will perform the recovery actions as defined in section 3.12.

3.9.2.1 HDR Responsibilities

The HDR processes both the scored patient and unscored DMP responses from either a Home Telehealth vendor server or the CDA. A vendor server may send either type of DMP response. The HDR will generate two acknowledgement messags to a vendor server. The first acknowledgement message will be an Accept ACK (Cx) that indicates that the message has been

received and will either be queued for processing (CA) or dropped (CR). The second acknowledgement message will be an Application ACK (Ax) that indicates that the HDR has either successfully or unsuccessfully processed the message. The acknowledgement of messages is defined in section A.5. The successful processing (AA) indicates the safe store of the DMP in the HDR; the inability to safe store the DMP generates an AR. The HDR system is the official the Home Telehealth DMP repository; that is, the HDR is the SOR (System of Record) for Home Telehealth medical data.

3.9.2.2 Common Data Aggregator (CDA) Responsibilities

The CDA processes both the scored and unscored patient DMP responses received from a Home Telehealth vendor server and stores the information in the Home Teleheath DMP patient response database. The CDA will also forward a DMP responses received from the vendor servers to the HDR. The DMP response submissions from patients managed by the CDA will be scored and sent to the HDR.

The CDA will generate two acknowledgement messages to a each DMP received. The first acknowledgement message will be an Accept ACK (Cx) that indicates that the message has been received and will either be queued for processing (CA) or dropped (CR). The second acknowledgement message will be an Application ACK (Ax) that indicates that the CDA has either successfully or unsuccessfully processed the message. The acknowledgement of message processing is defined in section A.5.

The CDA expectes two acknowledgement messags from the HDR. The first acknowledgement message is an Accept ACK (Cx) that indicates that the message has been received and will either be queued for processing (CA) or dropped (CR). The second acknowledgement message is an Application ACK (Ax) that indicates that the HDR has either successfully or unsuccessfully processed the message. The acknowledgement of messages is defined in section A.5. The successful processing (AA) indicates the safe store of the DMP in the HDR; the inability to safe store the DMP generates an AR. The HDR system is the official the Home Telehealth DMP repository; that is, the HDR is the SOR (System of Record) for Home Telehealth medical data.

3.9.2.3 Home Telehealth Database Responsibilities

The CDA interacts with the Home Telehealth database to store the DMP patient response data, the HL7 message, HL7 message routing history and HL7 message acknowledgments.

3.9.2.4 User Responsibilities

There is no user involved in the patient DMP response processing.

3.9.2.5 MPI Responsibilities

MPI is not involved in the patient DMP response processing.

3.9.3 Required Fields

The DMP patient response message contains all the fundamental data items defined in Table 69.

Table 69: DMP Response Data Items

Data item	Use	Source
Home Telehealth vendor server identification	Placed in MSH and OBX segments to identify the vendor server and vendor server application	Table 80 and Table 81
Patient identification	PID	Table 13
DMP identification	The DMP name and version	Table 71
DMP responses	The DMP response submission from the patient, optionally with scoring.	Appendix I

3.9.4 Data Nomenclature

The data elements collected from the DMP patient response message are defined in Appendix H.

3.9.5 Message Content

The DMP patient response HL7 formatted data is defined in the HL7 2.4 standard chapter 9 - *Medical Records/Information Management (Document Management*).

3.9.5.1 Message Format

The patient DMP response uses the Medical Document Management (MDM) Message as documented in chapter 9 of the HL7 standard. The event code is T02. The T02 event identifies the message as carrying an "original document and content". The HL7 document notification message has four data segments that contain the following information: message identification along with vendor identification (MSH), DMP submission identification (EVN), patient identification (PID), and DMP response submission data. Table 70 lists the segments in an MDM-T02 message for patient DMP response. The observation (OBX) segment identifies the DMP that was used to collect the responses and the patient responses encoded in XML (see Appendix I). The patient DMP response uses a single OBX segment to contain complete response and is structured to contain a single patient DMP response in a message.

Table 70: Home Telehealth DMP Response MDM-T02 Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message and sender identification along with routing information
EVN	Event Type	Required	Date and time of DMP response generating event
PID	Patient	Required	Patient information (identity)

Segment	Name	Required	Contents
	Identification		
OBX	DMP Response	Required	DMP response submission

The patient DMP response uses a single OBX segment. The *Observation Identifier* field (OBX-3) defines the XML XSD version and the DMP definition including the DMP version (Table 71). The *Observation Value* field (OBX-5) contains the complete text of the DMP response in a single field.

Table 71: DMP Response Observation Identifier in OBX-3 (HL7 CE Data Type)

Component	Name	Type	Value
OBX-3.1	Identifier	ST	XML Version
OBX-3.2	Text	ST	DMP Version
OBX-3.3	Name of Coding System	IS	DMP Title[102]
OBX-3.4	Alternate Identifier	ST	(the component is not supported)
OBX-3.5	Alternate Text	ST	(the component is not supported)
OBX-3.6	Name of Alternate Coding System	IS	(the component is not supported)

3.9.5.2 Example

Figure 48 is an example of a patient DMP response. The OBX segment contains only a fragment of the XML file and is truncated. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^)
- field components are separated by a "tilde" (~).

Variable entities are enclosed in "<" and ">"; the actual value is chosen from a table associated with the variable. The Home Telehealth vendor server must generate all mandatory fields.

[102] The official location of the DMP titles are to be supplied. The Census document is the source for the DMP titles.

MSH^~|\&^HTAPPL^<vendor server facility number>~<vendor server dns>~DNS^HTDMP^<DMP server facility number>~<DMP server dns>~DNS^^20040621104503-05 00^^MDM~T02^500167399^T^2.4^^^AL^AL^US

EVN^T02^20120228144455-0500^^2^32885~Blankenship~George~~~~~~~USVHA&&0363~L~~~NI~FACILITY&STATION&L^20120228144455-0500^

PID^1^^1234567890V123456~~~USVHA~NI~VA FACILITY ID&200M&L|1234567890~~~USVHA~PI~VA FACILITY&552&L|123456789~~~USSSA~SS~VA FACILITY ID&STATION&L^^Patient~Veterans~Aloysius~~~~L^Government~~~~~~~M^19461222^m^^w^^^^^^M^C^^^^^American^^^^^veteran^

OBX^1^TX^1.0~1.0~DMP Title^^<htNSdmpResponse:hthDMP xmlns:htNSdmpResponse="HTHDMP" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"><dmpGenericResponse><dmpVendorFacility>200Tx</dmpVendorFacility><dmpVendorName>Home Telehealth Emulator</dmpVendorName><dmpVendorMRN>1234567890</dmpVendorMRN><dmpScheduledDate>2012-01-28</scheduledDate><dmpCompletedDate>2012-01-28T14:44:55-0500</completedDate><dmpDeviceName>Home Telehealth emulator home device</deviceName><dmpResponseStatus>COMPLETE</dmpResponseStatus><dmpQuestionsAndAnswers><dmpQuestionAndAnswer><dmpQuestionNumber>1</dmpQuestionNumber><dmpAnswer>3</dmpAnswer></dmpQuestionAndAnswer><dmpQuestionAndAnswer><dmpQuestionNumber>2</dmpQuestionNumber><dmpAnswer>4</dmpAnswer></dmpQuestionAndAnswer><dmpQuestionAndAnswer><dmpQuestionNumber>3</dmpQuestionNumber><dmpAnswer>3</dmpAnswer></dmpQuestionAndAnswer><dmpQuestionAndAnswer><dmpQuestionNumber>4</dmpQuestionNumber><dmpAnswer>5</dmpAnswer></dmpQuestionAndAnswer><dmpQuestionAndAnswer><dmpQuestionNumber>5</dmpQuestionNumber><dmpAnswer>5</dmpAnswer></dmpQuestionAndAnswer><dmpQuestionAndAnswer><dmpQuestionNumber>6</dmpQuestionNumber><dmpAnswer>6</dmpAnswer></dmpQuestionAndAnswer><dmpQuestionAndAnswer><dmpQuestionNumber>7</dmpQuestionNumber><dmpAnswer>2</dmpAnswer></dmpQuestionAndAnswer><dmpQuestionAndAnswer><dmpQuestionNumber>8</dmpQuestionNumber><dmpAnswer>2</dmpAnswer></dmpQuestionAndAnswer></dmpQuestionsAndAnswers></dmpResponse></htNSdmpResponse:hthDMP>

Figure 48: Patient DMP Response

3.9.6 Acknowledge Message Content

The Acknowledgement message content is provided in the *VA Home Telehealth HL-7 Message formats* document and in section 3.12. The VA HL7 Server system (either the CDA or the HDR) generates an application acknowledgment message when it has processed the patient DMP result message.

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard and section 3.12.5. The Home Telehealth vendor server will mandate an acceptance of the patient DMP result itself (an application acknowledgement).

Figure 49**Error! Reference source not found.** is an example of a Message ACK message.

MSH^~|\&^*HTDMPPR*^<DMP server facility number>~<DMP server dns>~DNS^*HTAPPL*^<*facility number*>~*XYZ Corp server.MED.VA.gov ~DNS* ^20040621104503-0500^^*ACK*^*600167123*^T^2.4^^^ER^ER^USA

MSA^*CA*^*500167399*^^^^

Figure 49: Message ACK Message

Figure 50**Error! Reference source not found.** is an example of an Application ACK message:

MSH^~|\&^*HTDMPPR*^<DMP server facility number>~<DMP server dns>~DNS ^*HTAPPL*^<*facility number*>~*XYZ Corp server.MED.VA.gov*~*DNS* ^20040621104503-0500^^*ACK*^*600167123*^T^2.4^^^ER^ER^USA

MSA^*AA*^*500167399*^^^^

Figure 50: Application ACK Message

3.10 Patient Survey Reporting without Scoring

The Home Telehealth vendor server transfers the results of the patient satisfaction (VR-12) and Activities of Daily Living (ADL) surveys to the Home Telehealth patient survey system. The

response to a patient survey is encoded in XML. The XML is sent in an HL7 message without modification except for the use of the standard HL7 escape sequences to allow for special characters. The XML resides in an OBX segment as text string. The data is sent in an HL7 message documented in chapter nine of the HL7 2.4 standard. Chapter 9 defines messages to support *Medical Records/Information Management (Document Management)*. This section defines the patient survey reporting by a system that does not score the patient survey submission; that is, the raw results. The patient response is stored in the Home Telehealth Survey database to be used for program analysis.

3.10.1 Description

Survey responses are sent whenever a patient responds to a survey presented on the home unit or IVR. The requirements for the survey response are specified in a separate document defined in the references section (section 8). The format of the HL7 message is very similar to the format used for a progress note (section 3.7).

3.10.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; they are listed in sequential order.

3.10.2.1 Home Telehealth vendor server Responsibilities

The Home Telehealth vendor server automatically generates the XML file that contains the patient survey response. The XML file is sent in an HL7 message whenever a patient responds to a survey presented on the home unit.

3.10.2.2 Interface Engine Responsibilities[103]

The Interface Engine routes the message from the Home Telehealth vendor server through the Austin Interface Engine to the appropriate Interface Engine servicing the Home Telehealth survey database. The Interface Engine routes Acknowledgement messages originating at the Home Telehealth survey database to the Home Telehealth vendor server.

[103] The Home Telehealth program is currently bypassing the VIE infrastructure.

3.10.2.3 Home Telehealth Patient Survey Database Responsibilities

The Home Telehealth patient survey database system processes the patient survey information received from the vendor server and generates an acknowledgement to the Home Telehealth vendor server. The acknowledgement indicates the acceptance of the patient survey information. The survey database system scores the survey response and updates the Home Telehealth survey database. The scored survey is sent to the HDR.

3.10.2.4 User Responsibilities

There is no user involved in the patient survey processing.

3.10.2.5 MPI Responsibilities

MPI is not involved in the patient survey processing.

3.10.2.6 HDR Responsibilities

HDR is not involved in the unscored patient survey processing.

3.10.3 Required Fields

The patient survey response message contains the fundamental data items defined in Table 72.

Table 72: Home Telehealth Vendor Server Patient Survey Data Items

Data item	Use	Source
Home Telehealth vendor server identification	Placed in MSH and OBX segments to identify the vendor server and vendor server application	Table 80 and Table 81
Patient identification	PID	Table 13
Survey identification	The Survey name and version	Table 71
Survey responses	The Survey response submission from the patient, optionally with scoring.	Appendix J

3.10.4 Data Nomenclature

The data in the patient survey response is defined in the patient survey response document (section 8).

3.10.5 Message Content

The patient syrvey response HL7 formatted data is defined in the HL7 2.4 standard chapter 9 (*Medical Records/Information Management (Document Management*).

3.10.5.1 Message Format

The patient survey response function uses the Medical Document Management (MDM) Message as documented in chapter 9 of the HL7 standard. The event code is T02. The T02 event identifies the message as carrying an "original document and content". The HL7 document notification message has three data segments that contain the following information: message identification (MSH), document available event (EVN), and observation/result data. Table 73 lists the segment in an MDM-T02 message for a patient survey response. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 73: Home Telehealth MDM-T02 Segments (Patient Survey)

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
EVN	Event Type	Required	Date and time of patient survey file creation
PID	Patient Identification	Required	Patient information (identity)
OBX	Survey Response	Required	Patient survey XML file contents

The primary items of interest in the MSH segment (Table 6) are the identities of the Home Telehealth Vendor application/server, the Home Telehealth survey database application/server, the message type, and the acknowledgement requirements. The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The content of the EVN segment identifies the event as an original document notification (T02).

The observation (OBX) segment contains the text of the XML file. The information that is contained in the XML file is defined in Appendix J of this document. The patient Survey response uses a single OBX segment. The *Observation Identifier* field (OBX-3) defines the XML file version and the XML element definition version (Table 74). The *Observation Value* field (OBX-5) contains the complete text of the XML file in a single field.

Table 74: Patient Survey Observation Identifier in OBX-3 (HL7 CE Data Type)

Component	Name	Type	Value
OBX-3.1	Identifier	ST	XML Version
OBX-3.2	Text	ST	Survey Version
OBX-3.3	Name of Coding System	IS	Survey Title
OBX-3.4	Alternate Identifier	ST	(the component is not supported)
OBX-3.5	Alternate Text	ST	(the component is not supported)
OBX-3.6	Name of Alternate Coding System	IS	(the component is not supported)

3.10.5.2 Example

Figure 51 is an example of a patient survey response. The OBX segment contains only a fragment of the XML file and is truncated. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^) and
- field components are separated by a "tilde" (~).

Variable entities are enclosed in "<" and ">"; the actual value is chosen from a table associated with the variable. The Home Telehealth vendor server must generate all mandatory fields. The examples were created by Home Telehealth emulator.

```
MSH^~|\&^HTAPPL^200Tx~VAWW.emulator.CC.MED.VA.GOV~DNS^HT CENSUS^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^
20060105160525-0500^^MDM~T02^320060105160525^T^2.4^^^AL^AL^USA^^^^

EVN^T02^20060105160525-0500^^2^32885~Blankenship~George~~~~~~USVHA&&0363~L~~~NI~FACILITY&STATION&L^2006010516
0525-0500^

OBX^1^TX^1.0~1.0~Patient Satisfaction^^CONTENT TO BE SUPPLIED[104]
```

Figure 51: Patient Survey Response (unscored)

3.10.6 Acknowledge Message Content

The message content is given in the *VA Home Telehealth HL-7 Message formats* document and in section 3.12. The Home Telehealth survey database system generate an acknowledgment message when it has processed the survey response submission. Section 3.1.6 contains the general discussion of the commit and application acknowledgement.

3.10.6.1 Message Format

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard and section 3.12.5. The Home Telehealth Vendor Server will mandate an acceptance of the week patient survey response message itself and an application acknowledgement indicating either a successful or unsuccessful processing.

3.10.6.2 Example

The following three examples are of a message acceptance, a request acceptance (application acknowledge) and a request refusal (application negative acknowledgement). The error information in a request refusal is defined in the survey requirements document. The examples were created by the Home Telehealth survey database server and received by Home Telehealth emulator.

[104] Content example to be supplied

```
MSH|^~\&|HT SURVEY|552|HTAPPL|200T5|||ACK|A120060105154507|P|2.4|||||||
MSA|CA|120060105154507|||||
ERR|^0.000000^0.000000^0&Message accepted
```

Figure 52: Patient Survey Message Acceptance (Commit acknowledgement)

```
MSH|^~\&|HT SURVEY|552|HTAPPL|200T5|||ACK|A120060105154507|P|2.4|||||||
MSA|AA|120060105154507|||||
ERR|^0.000000^0.000000^0&Message accepted
```

Figure 53: Patient Survey Response Acceptance (Application Acknowledge)

```
MSH|^~\&|HT SURVEY|552|HTAPPL|200T5|||ACK|A120060105154507|P|2.4|||||||
MSA|AA|120060105154507|||||
ERR|OBX^5.000000^0.000000^0&reason for rejection of XML content
```

Figure 54: Patient Survey Response Refusal (Application Acknowledge)

3.11 Patient Survey Reporting with Scoring

The Home Telehealth vendor server transfers the results of the patient satisfaction (VR-12) and Activities of Daily Living (ADL) surveys to the Home Telehealth patient survey system. After scoring the patient responses, the submission of the patient survey is encoded in XML. The XML is sent in an HL7 message without modification except for the use of the standard HL7 escape sequences to allow for special characters. The XML resides in an OBX segment as text string. The data is sent in an HL7 message documented in chapter nine of the HL7 2.4 standard. Chapter 9 defines messages to support *Medical Records/Information Management (Document Management)*. The scored response is stored in the HDR for use by all VA systems.

3.11.1 Description

Survey responses are sent whenever a patient responds to a survey presented on the home unit or IVR. The requirements for the survey response are specified in a separate document defined in the references section (section 8). The format of the HL7 message is very similar to the format used for an unscored survey response (section 3.10).

3.11.2 Responsibilities

Responsibilities are the required actions necessary for the completion of the function; they are listed in sequential order.

3.11.2.1 Home Telehealth vendor server Responsibilities

The Home Telehealth vendor server will automatically generate the XML file that is used to contains the unscored patient survey response. A survey response is sent whenever a patient responds to a survey presented on the home unit. If the vendor has not implemented the scoring algorithm, the vendor will use the *Patient Survey Reporting without Scoring* (section 3.10) to forward the message to the Home Telehealth Survey engine that is capable of scoring the resonse.[105]

3.11.2.1 Home Telehealth Patient Survey Database Responsibilities

The Home Telehealth patient survey database system processes and scores patient survey responses received from the vendor servers. The survey database system updates the Home Telehealth survey database with the scored responses. The scored responses are sent to the HDR for use by other VA applications.

3.11.2.2 Interface Engine Responsibilities[106]

The Interface Engine routes the message from the Home Telehealth vendor server (if the vendor is capable of scoring) or the Home Telehealth Survey Database through the Austin Interface Engine to the appropriate facility Interface Engine servicing the Home Telehealth survey response database. The Interface Engine routes Acknowledgement messages originating at the Home Telehealth survey response database to the Home Telehealth vendor server.

3.11.2.1 HDR Responsibilities

The HDR processes both the scored patient survey responses from the Home Telehealth Survey Database. The HDR will generate two acknowledgement messags to a scored survey submission. The first acknowledgement message will be an Accept ACK (Cx) that indicates that the message has been received and will either be queued for processing (CA) or dropped (CR). The second acknowledgement message will be an Application ACK (Ax) that indicates that the HDR has either successfully or unsuccessfully processed the message. The acknowledgement of messages is defined in section A.5. The successful processing (AA) indicates the safe store of the scored survey in the HDR; the inability to safe store the scored survey generates an AR. The HDR system is the official the Home Telehealth scored survey repository; that is, the HDR is the SOR (System of Record) for Home Telehealth medical data.

---

105 There are no current plans for a vendor to send a scored survey response.

106 The Home Telehealth program is currently bypassing the VIE infrastructure.

3.11.2.2 User Responsibilities

There is no user involved in the patient survey processing.

3.11.2.3 MPI Responsibilities

MPI is not involved in the patient survey processing.

3.11.3 Required Fields

The patient Survey message contains the fundamental data items defined in Table 72.

3.11.4 Data Nomenclature

The data in the patient survey response is defined in the master patient survey document (section 8). The data in the patient survey response is defined in the patient survey response document (section 8).

3.11.5 Message Content

The patient survey response HL7 formatted data is defined in the HL7 2.4 standard chapter 9 (*Medical Records/Information Management (Document Management*).

3.11.5.1 Message Format

The patient survey response function uses the Medical Document Management (MDM) Message as documented in chapter 9 of the HL7 standard. The event code is T02. The T02 event identifies the message as carrying an "original document and content". The HL7 document notification message has three data segments that contain the following information: message identification (MSH), document available event (EVN), and observation/result data. Table 73 lists the segment in an MDM-T02 message for patient survey response. The *required* column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

The primary items of interest in the MSH segment (Table 6) are the identities of the Home Telehealth Vendor application/server, the Home Telehealth survey database application/server, the message type, and the acknowledgement requirements. The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The content of the EVN segment identifies the event as an original document notification (T02).

The observation (OBX) segment contains the text of the XML file. The information that is contained in the XML file is defined in Appendix K of this document. The patient scored survey response uses a single OBX segment. The *Observation Identifier* field (OBX-3) defines the XML file version and the XML element definition version (Table 74). The *Observation Value* field (OBX-5) contains the complete text of the XML file in a single field.

3.11.5.2 Example

Figure 55 is an example of a patient survey response. The OBX segment contains only a fragment of the XML file and is truncated. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^) and
- field components are separated by a "tilde" (~).

Variable entities are enclosed in "<" and ">"; the actual value is chosen from a table associated with the variable. The Home Telehealth vendor server must generate all mandatory fields. The examples were created by Home Telehealth emulator.

```
MSH^~|\&^HTAPPL^200Tx~VAWW.emulator.CC.MED.VA.GOV~DNS^HT SURVEY^552~DEVCRN.FO-ALBANY.MED.VA.GOV~DNS^
20060105160525-0500^^MDM~T02^320060105160525^T^2.4^^^AL^AL^USA^^^^

EVN^T02^20060105160525-0500^^2^32885~Blankenship~George~~~~~~~USVHA&&0363~L~~~NI~FACILITY&STATION&L^2006010516
0525-0500^

OBX^1^TX^1.0~1.0~Patient Satisfaction^^CONTENT TO BE SUPPLIED[107]
```

Figure 55: Patient Survey Response (scored)

3.11.6 Acknowledge Message Content

The acknowledgement messages are the same for the scored responses as the unscored responses (section 3.10.6).

3.12 Application Acknowledge Message[108]

The acknowledge message indicates the completion of a function that uses HL7 messaging. Acknowledgement messages are a component of priority one functions. This section covers the generation of an application acknowledgement. The processing associated with an application acknowledgement is discussed in section A.4.

3.12.1 Description

The data in the acknowledge message identifies the HL7 message that initiated the Home Telehealth function. Each function that is initiated by an HL7 message must be acknowledged indicating the successful or unsuccessful completion of the request. Each acknowledgment that indicates an unsuccessful completion must contain an error code and reason.

---

[107] Content example to be supplied

[108] While this section explicitly covers the application acknowledgement, it is generally applicable to the commit acknowledgement.

3.12.2 Responsibilities

The processing of the acknowledgement message is defined in the function sections (3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, and 3.8). The responsibilities define the actions that are to be performed by the system that originated the request and the system that processed the request.

3.12.3 Required Fields

The observation report contains the following fundamental data items:

- Sending device
- HL7 message that initiated the function
- Function completion status

3.12.4 Data Nomenclature

The application acknowledgements (errors) that are to be used by the Home Telehealth servers fall into the following general categories:

- Message format error
- Data content error
- Accounting error (or restriction)
- Capacity error (or restriction)

The message format error identifies that the server cannot process the message due to the construction of the message. The error text associated with the application rejection message is "message format error". Errors in the content of the message such as inconsistent patient identification are indicated by a reject message with the text string "data content error". The text string "accounting restriction" indicates that the message was formatted correctly and the patient was identified correctly, but that there is some sort of accounting restriction in effect at the current time and the request has not been honored. The text string "capacity restriction" indicates that the message was formatted correctly and the patient was identified correctly, but the server cannot handle the new patient at the current time.

3.12.5 Acknowledge Message Content

The message content is given in the *VA Home Telehealth HL-7 Message formats* document.

3.12.5.1 Message Format

The acknowledge function uses the General Acknowledgment (ACK) Message as documented in chapter 2 of the HL7 standard. Table 75 lists the segment in an ACK message. The *required*

column indicates those segments used by Home Telehealth; all data in optional segments can be ignored.

Table 75: Home Telehealth ACK Segments

Segment	Name	Required	Contents
MSH	Message Header	Required	Message identification and routing information
MSA	Message Acknowledgement	Required	Processing status for message being acknowledged (CA, CR, CE, AA, AE, or AR)
ERR	Error	Optional	Supplementary information

The HL7 Acknowledge message has three data segments. The identification (MSH) segment identifies the message. The content of the MSH segment is defined in section 3.1.5.1; the MSH is common to all HL7 messages. The Message Acknowledgement (MSA) segment identifies the message that is to be acknowledged (positively or negatively). The error (ERR) segment identifies the location of the error; the segment has only a single component. The HL7 Acknowledgement message has two or three data segments: the ERR data segment is only used for acknowledges that indicate an error. The identification (MSH) segment is used for HL7 routing. The receiving application and facility (MSH-5 and MSH-6) in the acknowledgement message are copied from the sending application and facility fields (MSH-3 and MSH-4) in the HL7 message that initiated the function. The sending application and facility (MSH-3 and MSH-4) in the acknowledgement message are copied from the sending application and facility fields (MSH-5 and MSH-6) in the HL7 message that initiated the function. For commit acknowledgement messages (MSH-1 is CA, CE, or CR), the MSH-15 field must be set to not request a commit acknowledgement (NE). For application acknowledgment messages (MSH-1 is AA, AE, or AR), the MSH-15 field may be set to request a commit acknowledgement (AL) for message accounting purposes.[109] The MSH-16 field must be set to not request an application acknowledgement. The Message Acknowledgement (MSA) segment identifies the message that is to be acknowledged (positively or negatively). The error (ERR) segment identifies the location of the error, if the acknowledgement indicates that the original message was rejected. The requirement for an acknowledgement is defined in the sign up message (section 3.1.5). The sign up can mandate a simple acceptance of the message, an acceptance of the sign up itself, or both.

Table 76: VA MSA Segment

Field	Name	Type	Example	VA use or definition
MSA-1	Acknowledgement Code	ID	AA	(HL7 Table 0008)
MSA-2	Message Control ID	ST		Contents of MSH-10 of original message

[109] It is recommended that all application acknowledgement message be set to request commit acknowledgement for message tracking purposes.

Field	Name	Type	Example	VA use or definition
MSA-3	Text Message	ST		(the field is not supported)
MSA-4	Expected Sequence Number	NM		(the field is not supported)
MSA-5	Delayed Acknowledgment	ID		(the field is not supported)
MSA-6	Error Condition	CE		See Table 78 (HL7 2.4 standard has this field deprecated in lieu of ERR-1.4)[110]

Table 77: VA ERR Segment

Component	Name	Type	Example	VA use or definition
ERR-1.1	Segment ID	ST	PID	Segment name with the error
ERR-1.2	Sequence	NM	3	Field number with the error
ERR-1.3	Field position	NM	4	Field component number with the error
ERR-1.4	Code identifying error	CE		See Table 78

Table 78: VA Error Condition Field

Sub-component	Name	Type	Example	VA use or definition
4.1	Identifier	ST	0	See Table 79, Table 68
4.2	Text	ST		See Table 79, Table 68
4.3	Name of coding system	IS	HL70357	(HL7 Table 0396)
4.4	Alternate identifier	ST		(the field is not supported)
4.5	Alternate text	ST		(the field is not supported)
4.6	Name of alternate coding system	IS		(the field is not supported)

Table 79: Home Telehealth Error Identifier/Text

Identifier	Text	Home Telehealth definition
100	Missing ICN	message does not have ICN
101	Missing DFN	message does not have DFN
102	Missing SSN	message does not have SSN
103	Missing name	message does not have name
104	Missing DOB	message does not have date of birth

[110] It is best that the Error Condition text be present in both MSA-6 and ERR-1.4 since various VA applications use MSA-6 and some use ERR-1.4.

Identifier	Text	Home Telehealth definition
105	Missing PID	message does not contain a PID segment
106	Missing PD1	message does not contain a PD1 segment
107	Missing PV1	message does not contain a PV1 segment
108	Missing consult number	message PV1 segment does not contain a consult number
109	Missing care coordinator	message PD1 segment does not contain a care coordinator
200	Invalid ICN	message contains an invalid ICN
201	Invalid DFN	message contains an invalid DFN
202	Invalid SSN	message contains an invalid SSN
203	Invalid name	message contains an invalid name[111]
204	Invalid DOB	message contains an invalid date of birth
208	Invalid consult number	message PV1 segment contains an invalid consult number
209	Invalid care coordinator	message PD1 segment contains an invalid care coordinator
300	Duplicate ICN	ICN in message duplicates an existing ICN in the vendor's database, but the validation data does not match, patient was identified by ICN.
301	Duplicate DFN	DFN in message duplicates an existing DFN in the vendor's database, but the validation data does not match, patient was identified by ICN.
302	Duplicate SSN	SSN in message duplicates an existing SSN in the vendor's database, but the validation data does not match, patient was identified using ICN (integrated patient) or DFN (legacy patient).
303	(no longer used)	
304	MPI reject	MPI rejected subscription request
305	MPI inconsistent ICN	Response from MPI subscription that is not the same as the sign up request PID or MPI update contains an ICN that cannot be located.
306	MPI inconsistent SSN	Response from MPI subscription has an SSN that is not the same as the sign up request PID or MPI A24 update contains identifies a patient with an inconsistent SSN.
307	MPI inconsistent DFN	Response from MPI subscription has a DFN that is not the same as the sign up request PID or MPI A24 update

[111] The vendor help desk must be prepared to delineate the exact reason for the name error.

Identifier	Text	Home Telehealth definition
		contains identifies a patient with an inconsistent DFN.
308	MPI inconsistent name or DOB	Response from MPI subscription has a name or DOB that is not the same as the sign up request PID or MPI A24 update contains identifies a patient with an inconsistent name or DOB.[112]
309	Patient active at <facility number>[113]	Sign Up message (activation) or Inactivation for a patient that is already active at another facility.
310	(no longer used)	
311	Malformed address	Address in PID is malformed (for example, invalid length or unrecognizable state).
312	Malformed telephone number	Telephone number in PID is unrecognizable.
313	Unknown facility number <facility number>[114]	The patient's facility is not registered with the vendor.
314	Legacy patient with inconsistent name or DOB	SSN located a legacy patient with either a different name or DOB.[115]
315	Cannot location patient with ICN <ICN>[116]	A patient with the received ICN could not be located in the vendor server database.
400	General error	The error was not covered by any other error code in this table.
401	Unsupported message type <type><event>[117]	An MSH segment was received with MSH-9 containing an unsupported value
402	Unsupported segment type	A segment was received that is not supported.

112 The vendor help desk must be prepared to delineate the exact reason for the name error.

113 The facility number of the sign up facility is to be used in the text of this error message.

114 The facility number from the message (MSH-4.1 or PV1-39 as appropriate) is to be used in the text of this error message.

115 The vendor help desk must be prepared to delineate the exact reason for the name error.

116 The ICN that was received is to be used in the text of this message.

117 The contents of MSH-9.1 and MSH-9.2 are to be used in the text of this error message.

Identifier	Text	Home Telehealth definition
	<segment identifier>[118]	
403	Wrong receiving facility <facility station>[119]	The receiving facility information does not refer to the vendor server.
404	Wrong sending facility or application <facility station>[120]	The sending facility/application information indicates that the message is coming from an incorrect source. The ADT-A04 and ADT-A03 messages cannot be accepted from the MPI.
405	Duplicate accepted message <message control ID>[121]	The message was previously processed successfully. The preferred method of handling a duplicate message is to retransmit the original Cx and Ax.
406	Duplicate rejected message <message control ID>[122]	The message was previously rejected. The preferred method of handling a duplicate message is to retransmit the original Cx and Ax.
407	Unsupported message processing type <type><event>[123]	An MSH segment was received with MSH-11 containing an incorrect value. A production interface (section A.3) must only move messages labeled "production" in MSH-11 (Table 10). A debug/test interface (section A.3) must only move messages labeled "debug" or "test" in MSH-11 (Table 10).[124]
408	Unsupported message type/event combination <type><event>[125]	An MSH segment was received with MSH-9 identifying a message category that is not supported. The message was not processed. An error will only be generated for messages that are not normally broadcasted, but are directed to a particular end system.

118 The segment identity is to be used in the text of this error message.

119 The station from MSH-6.1 is to be used in the text of this error message.

120 The station from MSH-4.1 is to be used in the text of this error message.

121 The message control ID of the message that was processed is to be used in the text of this error message.

122 The message control ID of the message that was rejected is to be used in the text of this error message.

123 The contents of MSH-9.1 and MSH-9.2 are to be used in the text of this error message.

124 See section 3.13 for the response to an unprocessable message.

125 The contents of MSH-9.1 and MSH-9.2 are to be used in the text of this error message.

The MSH data segment contains two items of interest for the Home Telehealth vendor server: the system that issued the request and the message type. The requesting system identifier is in the MSH-4 field (*Sending facility*). The format of VA facility identifiers is defined in section 3.1.5. The message type is in the MSH-9 field (*Message type*). The message type for the acknowledge message is **ACK**. The MSH segment is discussed in section 3.1.5.

The MSA data segment contains two fields of interest for positive acknowledgements and three fields for a negative acknowledgement. The control number for the original message is in the MSH-2 field (*Message Control ID*). The acknowledgement type is in the MSH-1 field (*Acknowledgement Code*). The valid codes are defined in the HL7 specification (Chapter 2 – HL7 Table 0008). If the message is a negative acknowledgement, the reason for the negative acknowledgement is (optionally) in the MSH-6 field (*Error Condition*); the MSH-6 field use has been deprecated. The reasons for rejection are discussed in section 3.12.4.

The ERR data segment contains further clarification of a negative acknowledgement. The reason for rejection should be specified in the ERR segment.

3.12.5.2 Example

The following example is of an acknowledgement that indicates an unsuccessful completion of a request. The VA defines the HL7 delimiters as:

- fields are separated by an "upper caret" (^) and
- field components are separated by a "tilde" (~).

The examples were created by Home Telehealth emulator.

```
MSH^~|\&^<application>^<facility number>~<facility DNS>~DNS^<application>^<facility number>~<facility DNS>~DNS^<date time>^^ACK^<control ID>^T^2.4^^^AL^NE^USA

MSA^AR^<Control ID of matching message>^^^^102~Data content error~HL70357

ERR^EVN~2~3
```

Figure 56: Request Rejection (Application Acknowledgement)

3.13 Unprocessable Messages

When a message is received, that is unprocessable due to fields in the MSH, an error indication is to be returned to the sender and an error alert is to be generated. If the sender cannot be identified from the MSH, the message is to be discarded.

The error indication format depends upon the contents of MSH-15 and MSH-16. If MSH-16 requests an application acknowledgement and MSH-15 requests a commit acknowledgement, then the proper response is to generate a CA indicating acceptance of the message and an AR to indicate the message could not be processed (see Table 79). It is not acceptable to generate a CR when an Ax is requested since a CR has only local significance; the sending application does not notification of the receipt of a CR. If MSH-16 requests an application acknowledgement and MSH-15 does not request a commit acknowledgement, then the proper response is to generate only an AR to indicate the message could not be processed (see Table 79). If MSH-16 does not

request an application acknowledgement and MSH-15 requests a commit acknowledgement, then the proper response is to generate a CR with an error code from Table 79. If MSH-16 does not request an application acknowledgement and MSH-15 does not request a commit acknowledgement, then the proper response is to discard the message without an error indication returned to the sender.

Every unprocessable message is to generate an error alert that is sent via email to a predefined distribution list. The VA OI Home Telehealth program group must be represented in the group. The alert message must minimally include the time and date that the message was received, the MSH of the message, an error message indicating the reason that the message was unprocessable and an identifier for the log file with the actual message.

3.14 Unsupported Messages

When a message is received that is either has an incorrect processing type (MSH-11) for the mode of the system or an unsupported message type (MSH-9), the message is to be discarded and an error alert is to be generated.

If MSH-15 requests an accept acknowledgement, then the proper response is to generate a CA indicating acceptance of the message. If MSH-16 requests an application acknowledgement, then the proper response is to generate an Ax indicating that the message was processed and an Error Condition (MSA-6 and ERR-1.4) with the appropriate text (Table 78). An AR should only be used if receipt and discard of the message is a condition that should generate a nationwide alert.

Every discarded message is to generate an error alert that is sent via email to a predefined distribution list. The VA OI Home Telehealth program group must be represented in the group. The alert message must minimally include the time and date that the message was received, the MSH of the message, an error message indicating the reason that the message was unprocessable and an identifier for the log file with the actual message.

4 Field Definitions

The HL7 standard defines two distinct categories of values in an HL7 field component. The first is the *null* value and the second is the *non-null* value. The null value is signified by a field component that is completely empty. If the field separator is '^', then the HL7 message fragment ^^ would indicate a *null* field or field component. The message fragment ^""^ is *non-null* value; it is the null string. A *null* field or field component indicates that the sender has no value for the data item defined by the field or the field component. No validation can be performed on a null field or field component. If the message is used to create a new data item (for example, patient record), the initial value for the data item should be null. If the message is an update type message, the current value of the data item is not to be replaced. A *non-null* field is to replace or used in a computation. At the current time, VistA implements the HL7 standard for defining empty fields or field components. For example, a PID in an ADT-A04 message with a *null* address field would not update the currently stored value for the patient's address. A

PID in an ADT-A04 with a "" in the street address component of the address would clear the stored street address. A PID in an ADT-A04 with a "1335 East West Hwy" would replace the stored address. At the current time, the MPI uses either a null value (^^) or a null string (^""^) to define an empty fields or field component. For example, a PID in an ADT-A31 message with a *null* address field would not update the currently stored value for the patient's address. A PID in an ADT-A31 with a "" in the street address component of the address would also not update the currently stored value for the patient's address. A PID in an ADT-A31 with a "1335 East West Hwy" would replace the stored address. A PID in an ADT-A31 with a " " would replace the stored address with a blank address. The MPI sends the messages defined in section 3.4 as update messages along with the RSP-K22, which is a response to an MPI subscription (section 3.3).

Table 80 contains the definitions of the fields used in the Home Telehealth HL7 messages.

Table 80: HL7 Field Definition

Field name	Description	Format	Definition
Address	HL7 generic address specification	Table 7	VistA supplied (in sign up message or MPI update)
Home Telehealth vendor server Application Identifier	HL7 uses this identifier in the MSH segment.	This is a string drawn from a legal list (see definition)	Table 81 "Home Telehealth 2004" is used as an example in this document.
Home Telehealth vendor server Identifier	HL7 uses this identifier in the MSH segment. It has three components: namespace, identifier, and identifier type.	The VA uses two facility types "DNS" and "L"	(see Table 7, Table 8, and Table 82)
Home Telehealth Device	The Home Telehealth identifier follows rules similar to the Home Telehealth vendor	Table 43	This shall be in the form of vendor~model of home device, i.e. ***XYZ Corp~123B~1.2*** <vendor>~~<model>~~<measurement device>

Field name	Description	Format	Definition
	server identifier.		
VistA Facility id[126]			VistA supplied (in sign up message or MPI update) The Home Telehealth project team maintains a file with the VA facility information on the Home Telehealth SharePoint.
VistA Facility Number[127]			VistA supplied (in sign up message or MPI update) The Home Telehealth project team maintains a file with the VA facility information on the Home Telehealth SharePoint.
Care Coordinator ID number	HL7 uses this identifier in the PD1 segment.	The ID number format is string.	VistA supplied (in sign up message or MPI update)
Care Coordinator name	HL7 uses this identifier in the PD1 segment.	Employee names are stored in a message using the HL7 XCN format.	VistA supplied (PD1-4)
ICN		The **Integration Control Number** is a unique identifier assigned to patients when they are added to the Master Patient Index. The **ICN** follows the ASTM E1714-95 standard for a universal health identifier. ICNs link patients to their records across VA systems.	VistA supplied (in sign up message or MPI update) An Integration Control Number (ICN) is a unique identifier assigned to each patient entry in the Master Patient Index linking patients to their records across VA systems. The ICN is a 10-digit number. It is simply a number used internally by Vista software. The ICN also has a 6-digit check sum associated with it. The ICN normally has the checksum concatenated to it with a V

[126] The facility information for a patient must be extracted from the source information (MSH-4.1 and MSH-4.2) of the ADT-A04 that activated the patient.

[127] The facility information for a patient must be extracted from the source information (MSH-4.1 and MSH-4.2) of the ADT-A04 that activated the patient.

Field name	Description	Format	Definition
		The ICN is stored in a message using the HL7 CX format (Table 14). The ID subfield is the ICN the type subfield is USVHA	separating the two. For example: **1000720100V271387**.
SSN		The SSN is stored in a message using the HL7 CX format (Table 14). The ID subfield is the SSN the type subfield is USSSA	VistA supplied (in sign up message or MPI update)
Patient Name	The patient name is stored in the PID segment	Patient names are stored in a message using the HL7 XPN format.	The name is present in PID-5.
Vital Type	Identification of the vital sign	The type is stored in a message as a string using the HL7 CE type.	(see Table 84, Table 85, Table 86, and Table 87)
Measurement Unit Type	Units of the vital sign observation	The type is stored in a message as a string using the HL7 CE type.	(see Table 84 and Table 86)
Measurement Source Type	Measurement source	The type is stored in a message as a string using the HL7 CE type.	(see Table 42)
Dialog Type		The type is stored in a message as a string using the HL7 ST type.	(see Table 90)
Progress Note Type		The type is stored in a message as a string using the HL7 ST type.	
Acknowledge Type	HL7 has commit acknowledgement	The type is stored in a message as a string	

Field name	Description	Format	Definition
	(generated by the IE) and application acknowledgement generated by peer application	using the HL7 ST type.	

Table 81 contains the valid VA application names. The name used in the MSH segment reflects the function being performed and must be appropriate for the receiving system.

Table 81: VA Application Names for MSH Segment

Application name	Description	Usage
MPIF TRIGGER	ADT-A28 ADT-A24 ADT-A31 ADT-A40 ADT-A43	Used for MPI update messages (source and destination)[128]
VAFC TRIGGER	MFN-M05	Used for Treating Facility Master file update messages (source and destination)[129]
DG HOME TELEHEALTH	ADT-A03 ADT-A04	Used for sign up/activation/inactivation messages
RG ADT	ADT-A01 ADT-A03 ADT-A04 ADT-A08	Used for normal registration message[130]
RG CIRN	ADT-A31	Used for change of CMOR messages[131]
MPIF CMOR RSLT	ADT-A31	Used for sending CMOR update messages[132]

128 Home Telehealth does not support the ADT-28 and ADT-A40 messages; they should be discarded. If they request an application ACK, they should be positive acknowledged (AA) with an error text of "Request discarded".

129 Not used by Home Telehealth.

130 Not used by Home Telehealth

131 Not used by Home Telehealth

Application name	Description	Usage
MPIF LOC/MIS		Used for MPI assignment of ICN or ICN resolution[133]
MPIF MPI	ADT-A29	Used with MPI to inactivate ICN messages[134]
MPIF CMOR COMP	ADT-A31	Used to communicate CMOR change messages (MPI)[135]
MPIF A29 Server	ADT-A29	Used for inactivate ICN messages (MPI)[136]
MPIF STARTUP		Used by VA facility to send query for ICN to MPI[137]
MPI	QBP-Q22 RSP-K22	Used by Home Telehealth to send a query to MPI and the MPI in its response
HTH HDR	ORU-R01	Used by Home Telehealth to identify the HDR application
HDRVTLS	ORU-R01	Used by Home Telehealth to identify the vendor application
TIUHL7	MDM-T02	Used by Home Telehealth to send progress notes to TIU
HT CENSUS	MDM-T02	Used by Home Telehealth to send the weekly patient census to

132 Not used by Home Telehealth

133 Not used by Home Telehealth

134 Not used by Home Telehealth

135 Not used by Home Telehealth

136 Not used by Home Telehealth

137 Not used by Home Telehealth

Application name	Description	Usage
		the Home Telehealth patient census database
HT SURVEY	MDM-T02	Used by Home Telehealth to send a patient survey response to the Home Telehealth patient survey database

Table 82 contains the values used to identify an individual Home Telehealth vendor server. They are used in the facility identifiers defined in Table 7, Table 8, and Table 43.

Table 82: VA Home Telehealth Vendor Identifier Components

Vendor	Facility name[138]	Facility Number	HL7 Listener DNS
AMD	Telehealth AMD	200T2[139]	vaww.hl7.amdtelemed.cc.med.va.gov
ATI	Telehealth American TeleCare Inc. (ATI)	200T6	vaww.hl7.ati.cc.med.va.gov
Authentidate	Telehealth Authentidate	200T8	vaww.hl7.authentidate.cc.med.va.gov
Cardiocom	Telehealth Cardiocom	200T7	vaww.hl7.cardiocom.cc.med.va.gov
Carematix	Telehealth Carematix	200T3[140]	vaww.hl7.carematix.cc.med.va.gov
Health Hero	Telehealth Health Hero	200T1	vaww.hl7.healthhero.cc.med.va.gov
Vitel Net	Telehealth ViTel Net	200T4	vaww.hl7.vitelnet.cc.med.va.gov
Viterion	Telehealth Viterion	200T5	vaww.hl7.viterion.cc.med.va.gov
Emulator	Telehealth	200TX	itl.hl7.emulator.cc.med.va.gov[141]

138 The facility name is not to be considered as an official name or as an required name for the Home Telehealth vendor.

139 This facility number is used by the Home Telehealth program to monitor production systems.

140 This facility number is used by the Home Telehealth program to monitor production systems.

141 The VAWW.HL7.EMULATOR.CC.MED.VA.GOV should not be considered a production interface. The emulator will reject all HL7 messages with a Processing ID of P in MSH-11.

Vendor	Facility name[138]	Facility Number	HL7 Listener DNS
	Emulator		

5 Observation Data Items

The following tables (Table 83, Table 84, Table 85, Table 86, and Table 87) define the required and standardized names for data items that are handled by Home Telehealth systems and placed in observation messages. Standardized names have an associated VUID; the VUID column is to the right of the name that has been standardized. Only standardized names can be placed in observation messages. Entries in the following tables cannot be used, if the names have not been standardized.

Table 83 lists the methods used to enter data for Home Telehealth. The data entry method *self entered* indicates that the patient entered the measurement result into the home device manually. The data entry method *device entered* indicates that the measurement was taken by an end-device connected to the home unit and entered into the home unit by the end-device.

Table 83: Data Entry Methods

Code	Data Entry Method Code VUID	Method
Self entered	4500982	The data was entered manually by the patient
Device entered	4500983	The data was collected and entered by a end device attached to the home unit

Table 84 and Table 85 contain the vital sign type and vital sign type observation qualifiers used by the HDR. Table 86 and Table 87 contain the laboratory result types and laboratory result type observation qualifiers used by the HDR. Every observation must use these values in the service identifier or qualifier (Table 36)

Table 84: GMRV Vital Sign Types

Vital Sign	Code	Vital Sign VUID	Units[142]	Units VUID	Range
AUDIOMETRY	AUD				
BLOOD PRESSURE	BP	4500634	mmHg	4500986	Systolic (30-350 mm Hg), Diastolic (20-250 mm Hg)

[142] Units encoded in CE data type must be mixed case.

Vital Sign	Code	Vital Sign VUID	Units[142]	Units VUID	Range
CENTRAL VENOUS PRESSURE	CVP				
CIRCUMFERENCE/GIRTH	CG				
FETAL HEART TONES	FHT				
FUNDAL HEIGHT	FH				
HEARING	HE				
HEIGHT	HT				
PAIN	PN	4500635	Verbal Numeric Analog Scale	4500987	0 to 10, 99
PULSE	P	4500636	beats/min	4500988	40 to 200
PULSE OXIMETRY	PO2	4500637	%	4500990	80 to 100
RESPIRATION	R				
TEMPERATURE	T	4500638	F	4500991	90 to 110
TONOMETRY	TON				
VISION CORRECTED	VC				
VISION UNCORRECTED	VU				
WEIGHT	WT	4500639	Pounds	4500989	66 to 375

Table 85: GMRV Vitals Qualifier

Text	Synonym	VUID	Vital type	Category
ABDOMINAL	Abd		CIRCUMFERENCE/GIRTH	LOCATION
ACTUAL	A		WEIGHT	QUALITY
ACTUAL	A		HEIGHT	QUALITY
ADULT CUFF	AC	4500641	BLOOD PRESSURE	CUFF SIZE
AEROSOL/HUMIDIFIED MASK	AM		PULSE OXIMETRY/O2 SATURATION	METHOD
ANKLE	Ank		CIRCUMFERENCE/GIRTH	LOCATION
APICAL	Ap		PULSE	LOCATION
ASSISTED VENTILATOR	AV		RESPIRATION	METHOD
AUSCULTATE	Aus		PULSE	METHOD
AXILLARY	Ax		TEMPERATURE	LOCATION
BED	B		WEIGHT	METHOD
BILATERAL PERIPHERALS	BiP		PULSE	LOCATION
BRACHIAL	Bra		PULSE	LOCATION
CALF	Clf		CIRCUMFERENCE/GIRTH	LOCATION

Text	Synonym	VUID	Vital type	Category
CAROTID	Car		PULSE	LOCATION
CHAIR	Ch		WEIGHT	METHOD
CONTROLLED VENTILATOR	CV		RESPIRATION	METHOD
CORE	C		TEMPERATURE	LOCATION
CUFF	Cu		BLOOD PRESSURE	METHOD
DOPPLER	Dop		PULSE	METHOD
DOPPLER	Dop		BLOOD PRESSURE	METHOD
DORSALIS PEDIS	DP		PULSE	LOCATION
DRY	D		WEIGHT	QUALITY
ESTIMATED	E		WEIGHT	QUALITY
ESTIMATED	E		HEIGHT	QUALITY
FACE TENT	FT		PULSE OXIMETRY/O2 SATURATION	METHOD
FEMORAL	Fem		PULSE	LOCATION
HEAD	Hd		CIRCUMFERENCE/GIRTH	LOCATION
L ARM	LA		BLOOD PRESSURE	LOCATION
LEAD	L		PULSE	METHOD
L LEG	LL		BLOOD PRESSURE	LOCATION
LEFT	Lt		PULSE	SITE
LEFT	Lt		CIRCUMFERENCE/GIRTH	SITE
LG ADULT CUFF	LAC		BLOOD PRESSURE	CUFF SIZE
LOWER ARM	LrA		CIRCUMFERENCE/GIRTH	LOCATION
LYING	Ly		BLOOD PRESSURE	POSITION
LYING	Ly		RESPIRATION	POSITION
LYING	Ly		PULSE	POSITION
MASK	M		PULSE OXIMETRY/O2 SATURATION	METHOD
MONITOR	Mo		PULSE	METHOD
NASAL CANNULA	NC		PULSE OXIMETRY/O2 SATURATION	METHOD
NON RE-BREATHER	NRB		PULSE OXIMETRY/O2 SATURATION	METHOD
NON-INVASIVE	N-I		BLOOD PRESSURE	METHOD
NON-VERBAL	N-V		PAIN	METHOD
ORAL	O	4500642	TEMPERATURE	LOCATION
PALPATED	Pal		PULSE	METHOD
PALPATED	Pal		BLOOD PRESSURE	METHOD
PARTIAL RE-BREATHER	PRB		PULSE OXIMETRY	METHOD
PEDIATRIC CUFF	PdC		BLOOD PRESSURE	CUFF SIZE

Text	Synonym	VUID	Vital type	Category
PERIPHERAL	Per		PULSE	LOCATION
POPLITEAL	Pop		PULSE	LOCATION
POSTERIOR TIBIAL	PT		PULSE	LOCATION
R ARM	RA		BLOOD PRESSURE	LOCATION
R LEG	RL		BLOOD PRESSURE	LOCATION
RADIAL	Rad		PULSE	LOCATION
RECTAL	R		TEMPERATURE	LOCATION
RIGHT	Rt		PULSE	SITE
RIGHT	Rt		CIRCUMFERENCE/GIRTH	SITE
ROOM AIR	R/A		PULSE OXIMETRY/O2 SATURATION	METHOD
SEMIFOWLERS	SFL		BLOOD PRESSURE	POSITION
SITTING	SIT		BLOOD PRESSURE	POSITION
SITTING	SIT		RESPIRATION	POSITION
SITTING	SIT		PULSE	POSITION
SKIN	S		TEMPERATURE	LOCATION
SM ADULT CUFF	SAC		BLOOD PRESSURE	CUFF SIZE
SPONTANEOUS	Spo		RESPIRATION	METHOD
STANDING	St		BLOOD PRESSURE	POSITION
STANDING	St	4500643	WEIGHT	METHOD
STANDING	St		RESPIRATION	POSITION
STANDING	St		PULSE	POSITION
THIGH	Thi		BLOOD PRESSURE	CUFF SIZE
THIGH	Thi		CIRCUMFERENCE/GIRTH	LOCATION
THIGH CUFF	ThC		BLOOD PRESSURE	CUFF SIZE
T-PIECE	TP		PULSE OXIMETRY	METHOD
TRACHEOSTOMY COLLAR	TC		PULSE OXIMETRY	METHOD
TYMPANIC	Tym		TEMPERATURE	LOCATION
ULNAR	Uln		PULSE	LOCATION
UPPER ARM	UpA		CIRCUMFERENCE/GIRTH	LOCATION
VENTILATOR	Ven		PULSE OXIMETRY	METHOD
VENTURI MASK	VM		PULSE OXIMETRY	METHOD
VERBAL	Ver		PAIN	METHOD
WRIST	Wri		CIRCUMFERENCE/GIRTH	LOCATION

Table 86: Laboratory Result Types

Text	Code	VUID	Units[143]	VUID	Range
BLOOD GLUCOSE	BG	4500640	mg/dl	4500985	0 to 450

Table 87: Laboratory Result Qualifier

Lab qualifier	Synonym	VUID	Lab type	Category
Fasting Yes - patient confirms that they were fasting	Yes		BLOOD GLUCOSE	QUALITY
Fasting No - patient confirms that they were NOT fasting	No		BLOOD GLUCOSE	QUALITY
Fasting Unknown – patient did not furnish fasting information	Unknown		BLOOD GLUCOSE	QUALITY
Finger stick glucose	Finger		BLOOD GLUCOSE	METHOD

Table 88: Submission Error Qualifier

Text	Explanation	VUID
Incorrect date/time	The date/time stamp of the submission was questionable	4500625
Incorrect patient	(not used by Home Telehealth)	4500626
Incorrect reading	The date/time stamp of the submission was questionable	4500627
Invalid record	(not used by Home Telehealth)	4500628

Table 89: Clinic Stop List

Clinic Name	Code	Description
NONVIDEO HOME TELEHEALTH MONIT	683	Identifies that the data collected and sent by the home device is non-video data
NONVIDEO HOME TELEHEALTH INTERVENTION	684	Identifies that the data collected and sent by the home device is non-video data requiring an intervention
HOME TELEVIDEO CARE	179	Identifies that the data collected and sent by the home device is video data

6 Dialogues

Table 90 contains the standard dialogue names.

[143] Units encoded in CE data type must be mixed case.

Table 90: Disease Dialogues

Disease Dialogue	Disease State	Language
Acute Heart Failure	Single	English
Advanced Illness	Single	English
Advanced Illness/Palliative Care	Single	English
Anticoagulation	Single	English
CAD	Single	English
Cancer – Acute	Single	English
Cancer – Maintenance	Single	English
Chronic Bronchitis	Single	English
Chronic Obstructive Pulmonary Disease – Acute	Single	English Spanish
Chronic Obstructive Pulmonary Disease - Maintenance	Single	English Spanish
Chronic Pain	Single	English
Congestive Heart Failure	Single	English Spanish
Congestive Heart Failure Maintenance	Single	English
Continuous Oxygen Use	Single	English
Depression	Single	English
Depression – SF-12	Single	English
Diabetes	Single	English Spanish
Diabetes – Maintenance	Single	English Spanish
Great Game Plan	Single	English
Hepatitis C	Single	English
HIV	Single	English
Hypertension – Acute	Single	English Spanish
Hypertension – Maintenance	Single	English Spanish
LAMP	Single	English
Learning Needs	Single	English
Major Depressive Disorder	Single	English Spanish
Multiple Sclerosis – DMT	Single	English
Multiple Sclerosis – Respiratory	Single	English
Multiple Sclerosis – Skin	Single	English
Myocardial Infarction Heartlink	Single	English
Polypharmacy	Single	English

Disease Dialogue	Disease State	Language
Post Traumatic Stress Disease	Single	English
Ritalin Study	Single	English
Substance Abuse	Single	English
Schizophrenia	Single	English
Weight Control	Single	English
Bipolar (Depression & Mania)	Co-morbid	English
Acute Heart Failure/Diabetes	Co-morbid	English
Chronic Obstructive Pulmonary Disease/Diabetes	Co-morbid	English
Chronic Obstructive Pulmonary Disease/Diabetes/ Hypertension	Co-morbid	English
Chronic Obstructive Pulmonary Disease/Diabetes/Weight	Co-morbid	English
Chronic Obstructive Pulmonary Disease/Hypertension	Co-morbid	English
Chronic Obstructive Pulmonary Disease/Hypertension - Maintenance	Co-morbid	English
Congestive Heart Failure/Hypertension	Co-morbid	English
Congestive Heart Failure/Hyperlipidemia	Co-morbid	English Spanish
Congestive Heart Failure/Diabetes	Co-morbid	English
Congestive Heart Failure/Diabetes - Maintenance	Co-morbid	English
Congestive Heart Failure/Diabetes/Hypertension	Co-morbid	English
Congestive Heart Failure/Diabetes/Hypertension – Maintenance	Co-morbid	English
Congestive Heart Failure/Diabetes/Chronic Obstructive Pulmonary Disease	Co-morbid	English
Coronary Artery Disease/Angina	Co-morbid	English
Diabetes/Hypertension	Co-morbid	English
Diabetes/Coagulation	Co-morbid	English
Hypertension/Hyperlipidemia	Co-morbid	English Spanish
Pain/Congestive Heart Failure	Co-morbid	English
Pain/Diabetes	Co-morbid	English
Pain/Hypertension	Co-morbid	English
Pulmonary/Weight	Co-morbid	English
Schizophrenia/Diabetes	Co-morbid	English
TACTICS (Diabetes/Depression)	Co-morbid	English

7 Standard Home Telehealth Document Names

The Home Telehealth uses three VA notes as a paper record of the patient's participation in Home Telehealth program. The data standardization group has standardized the names of the Home Telehealth notes so that they can be easily located and indexed. Each note name has two components. The prefix identifies that the document deals with Home Telehealth; the prefix is *Care Coordination/Home Telehealth*. The suffix identifies the purpose of the document. Table 91 defines the notes used for Home Telehealth. Table 92 defines the clinic names used in Home Telehealth documents (progress notes).

Table 91: Home Telehealth Standard Document Titles

Document	Name	Use
Consult	Care Coordination Home Telehealth Screening	This Consult title is used by the clinical staff to request that the Clinical Care staff evaluate a patient for Home Telehealth services. The Consult Document contains the resolution of the Consult Request and includes whether or not the patient is eligible for enrollment in the Care Coordinator Home Telehealth Program. This manually generated document links to the Consult and completing this Document closes the Consult. A care provider creates the consult note to justify the placement of a patient in the Home Telehealth program. The index number of the consult note is sent to the Home Telehealth vendor server in the Sign Up message (section 3.1)
"summary of episode" Progress Note	Care Coordination Home Telehealth Summary of Episode Note	This Note documents the monthly monitoring by nonvideo messaging device stop code 683. This vendor generated Note links to the Consult. The Home Telehealth vendor

Document	Name	Use
		server creates a template for a draft progress note every twenty-eight days summarizing the number of observations collected for the patient (section 3.7). The template is used to create a note indicating the patient's general progress and for program census tracking.
"out-of-bounds" Progress Note	Care Coordination Home Telehealth Subsequent Eval Note	This Note documents all interventions because of monitoring by nonvideo messaging device stop code 684. This vendor-generated Note links to the Consult. The Home Telehealth vendor server creates a template for a draft progress note when the collected observations fall outside a pre-determined boundary (section 3.7). If the out-of-bounds indication is validated by a care coordinator, a progress note will be created.
	Care Coordination Home Telehealth Evaluation Treatment Plan	This Note documents the first visit with the patient/caregiver and includes informed consent and the final care coordination plan. The primary care provider co-signs this Note.
	Care Coordination Home Telehealth Video Visit Note	This Note documents any visit over a video device (telemonitor and videophone) that meets required criteria for stop code 179.
	Care Coordination Home Telehealth Discharge Note	This Note documents closure of the patients' case and discharge from the Care Coordination Home Telehealth program.

Document	Name	Use
	Care Coordination Home Telehealth Telephone Encounter Note	This Note documents telephone contact between Care Coordination Home Telehealth staff and the patient.
	Care Coordination Home Telehealth Evaluation Note	This Note can document reassessment of any problem, issue or concern previously documented for the patient.
	Care Coordination Home Telehealth Education Note	This Note documents patient education, skill validation and installation for technology on all Care Coordination Home Telehealth patients.

Table 92: Home Telehealth Clinics

Document	Clinic	Use
”summary of episode” Progress Note	CCHT NON VIDEO MONITOR REVIEW	The standardized clinic that is used to for the daily monitoring of Home Telehealth patients while at home.
“out-of-bounds” Progress Note	CCHT NON VIDEO INTERVENTION	The standardized clinic that is used for an intervention or call to identify, arrange, coordinate care outside of CCHT department. This is not a call with the patient.

8 References

8.1 Web Sites

VHA OI Home Telehealth Web site containing this document and other information can be found at URL http://vaww.va.gov/techsvc/projects/HomeTelehealthHL7.html

8.2 VA Message Profiles

VA Home Telehealth HL-7 Message Formats document was issued with the Home Telehealth solicitation and is available upon request. It contains the original HL7 message formats.

HL7 Vitals Message Profile (http://vaww.va.gov/techsvc/projects/eHomeCare/HDRVitalsMessageProfile.doc) defines the HL7 messages used to transfer vitals to HDR.

HL7 Telehealth Message Profiles (http://vaww.va.gov/techsvc/projects/HomeTelehealthHL7.html) defines the HL7 messages used to implement the Home Telehealth patient sign up, observation, and acknowledgements.

8.3 VA HL7 Guides

Master Patient Index (MPI)/Patient Demographics (PD) HL7 Interface Specification (http://vista.med.va.gov/VistA_Lib/Clinical/MPI_Patient_Demographics_(MPI-PD)/MPI_PD_HL7_Interface.pdf) defines the HL7 message ate are used with MPI.

8.4 VA Standards Specifications

VA Data Standards group posts the current standards work at URL http://vaww.infoshare.va.gov/Data_Standardization/Working%20Groups/Vitals_DAT/default.aspx.

8.5 HL7 Standard Specifications

Health Level Seven, Version 2.4 standard can be found at URL http://vista.med.va.gov/messaging/msgadmin/hl7_specifications.asp.

8.6 Home Telehealth Specific Specifications

The Home Telehealth message specifications can be found on the VHA OI Home Telehealth Web site in the document labeled *Home Telehealth HL7 Functions Overview*. The document location is in the *HL7* section of the web site. The document is also available on the ***VA supplied Templates and support docs*** section of the Home Telehealth share point.

The patient census XML file documentation can be found on the VHA OI Home Telehealth Web site in the document labeled *VHA Home Telehealth Patient Census-Reporting Message Description*. The official title of the document is *Home Telehealth Patient Census Reporting*. The documents location is in the Census section of the web site. The document is also available on the ***VA supplied Templates and support docs*** section of the Home Telehealth share point.

The patient survey XML file documentation can be found on the VHA OI Home Telehealth Web site in the document labeled *Home Telehealth Specification for Automated Administration of VR-12 and Patient Survey Questionnaires to be Used in Negotiating a Contract Amendment with Group 1 Home Telehealth Contract Awardees*. The documents location is in the Survey section of the web site. The document is also available on the ***VA supplied Templates and support docs*** section of the Home Telehealth share point.

The business rules that govern the handling of patient vital signs are defined in the *VA Home Telehealth Date/Time and Measurement Business Rules*. The document is also available on the ***VA supplied Templates and support docs*** section of the Home Telehealth share point.

8.7 Miscellaneous Documents

The institution master file is maintained on FORUM.

- A current extract from that file can be found at URL http://vaww.va.gov/techsvc/projects/VIC/FacilityAddresses_Vendor.txt.
- The File Format Specification can be found at URL http://vaww.va.gov/techsvc/projects/VIC/FacilityAddressFileFormat.doc.

A complete list of VA IT acronyms can be found at URL http://vaww1.va.gov/med/acronyms/acronym.cfm

9 Glossary

Table 93 contains a definition of terms used in this document.

Table 93: Glossary

Term	Definition
ACK	General Acknowledgment message. The ACK message is used to respond to a message where there has been an error that precludes application processing or where the application does not define a special message type for the response.
Acknowledgment - Application Level	The appropriate application on the receiving system receives the transaction and processes it successfully. The receiving system returns an application-dependent response to the initiator.
Acknowledgment - Accept Level	The receiving system commits the message to safe storage in a manner that releases the sending system from any obligation to resend the message. A response is returned to the initiator indicating successful receipt and secure storage of the information.
Austin Automation Center (AAC)	AAC is a corporate data center for VA. The central repository for National Patient Care Database is maintained at the AAC.
Care Coordinators	Care Coordinators are licensed health care professionals who help veteran patients self-manage their condition and in doing so guide and support them to ensure they receive the right care, in the right place, at the right time from the right person.
Consult	Referral of a patient by the primary care physician to another hospital service/ specialty, to obtain a medical opinion based on patient evaluation and completion of any procedures, modalities, or treatments the consulting specialist deems necessary to render a medical opinion.
Computerized Patient Records System (CPRS)	CPRS provides an integrated patient record system for clinicians, managers, quality assurance staff, and researchers. The primary goal of CPRS is to create a fast and easy-to-use product that gives physicians enough information through clinical reminders, results reporting, and expert system feedback to make better decisions regarding orders and treatment. V*IST*A software integrated with CPRS includes Pharmacy,

Term	Definition
	Lab, Radiology, Allergy Tracking, Consults, Dietetics, Progress Notes, Problem List, Patient Administration, Vitals, PCE, TIU, ASU and Clinical Lexicon.
Data File Number (DFN)	Patient's Internal Entry Number (IEN)
Data Verification	The verification of the data in an HL7 message field is meant to validate that data present in an HL7 message agrees with a local copy of data or secondary copy. The objective of verification is to prevent a data corruption issue in a local database. If a particular data item does not exist (or is null) in a source HL7 message, no verification is required for the item. Data items in a source HL7 message that do not have a local copy or are not present in the secondary copy, do not require verification. Data verification does not change any local data. Data verification is a pass-fail. All data in the source HL7 message must pass the verification or the verification process fails.
Disease Management Protocol (DMP)	A DMP is a set of questions to be answered and list of vital signs to be collected ar regular intervals directing the care of a patient in the Home Telehealth program. The objective of the collection is to evaluate the condition of the patient at a given point of time.
Health Level 7 (HL7)	HL7 is an ANSI standard for electronic data exchange in healthcare environments. It is an interface specification designed to standardize the transfer of health care information between systems. Health Level Seven (HL7) is an application layer protocol for electronic data exchange in health care environments. The HL7 protocol is a collection of standard formats for health care data. This communication protocol allows healthcare institutions to exchange key sets of data between different application systems. The protocol accommodates the flexibility necessary to allow compatibility for specialized data sets that have facility specific needs.
ID	Coded Value data type
Interface Engine (IE)	A device or software application that connects disparate system, transforms data, converts data, routes data, ensures the delivery of data and is rules based. The IE provides a consistent HL7 compliant communication environment. That is separate from the specific and individual application needs. Within this environment, messages can be routed, transformed, converted and delivery guaranteed as required by the application.
Integrated patient	An integrated patient is a patient that is present in the vendor database and has an ICN in the database. An integrated patient will have an ICN, DFN (from the current or last facility) and an SSN in the database.
Integration Control Number (ICN)	The Integration Control Number is a unique identifier assigned to patients when they are added to the Master Patient Index. ICNs fall

Term	Definition
	under two categories: national and local. The ICN follows the ASTM E1714-95 standard for a universal health identifier. ICNs link patients to their records across VA systems. The ICN is stored in a message using the HL7 CX format. The ID subfield is the ICN. The type subfield is USVHA.
Legacy patient	A legacy patient is a patient that is present in the vendor database, but does not have an ICN in the database. A legacy patient will only have an SSN in the database.
Master Patient Index (MPI)	The objectives of Master Patient Index (MPI) are to create an index that uniquely identifies each active patient treated by the Veterans Administration and to identify the sites where a patient is receiving care. This is crucial to the sharing of patient information across sites. Master Patient Index manages the synchronization of patient file information with the Master Patient Index and with the patient's treating facilities to insure that data being shared is stored in the correct patient's record.
Non-integrated patient	A non-integrated patient is a legacy patient.
Non-legacy patient	A non-legacy patient is an integrated patient.
Protocol	A set of procedures for establishing and controlling data transmission
RDV	Remote Data View (RDV) is a CPRS application that allows a caregiver to view patient data that is stored in another VistA facility.
Telehealth	Telehealth is the use of electronic communications and information technology to provide and support health care when distance separates the participants. It covers health care practitioners interacting with patients and patients interacting with other patients.
Telemedicine	Telemedicine is the provision of care by a licensed independent health care provider that directs, diagnoses, or otherwise provides clinical treatment delivered using electronic communications and information technology when distance separates the provider and the patient. .
TCP/IP	(Transaction Control Protocol/Internet Protocol) A set of protocols for Layers 3 (Network) and 4 (Transport) of the OSI network model. TCP/IP has been developed over a period of 30 years under the auspices of the Department of Defense. It is a de facto standard, particularly as higher-level layers over Ethernet. TCP/IP predates the OSI model; and thus, TCP/IP is not OSI-compliant.
TCP socket reset	A TCP socket reset is accomplished by the closing of a currently active socket and the opening of a new socket to the same destination system and port.
Timestamp	A time stamp defines the date and time of an event. The format of all time stamps used by Home Telehealth is in accordance with the HL7

Term	Definition
	standard (see section 2.9.47 of the Health Level Seven, Version 2.4 standard).
VistA	Veterans Health Information Systems and Technology Architecture, formerly known as Decentralized Hospital Computer Program (DHCP), encompass the complete information environment at VA medical facilities. It consists of hardware, software packages, and comprehensive support for system-wide and station specific, clinical, and administrative automation needs.
VistA Interface Engine (VIE)	The Vitria BusinessWare software that has been configured specifically for the VHA VistA environment
VistA Web	A new web based application to view patient data at a set of VA facilities.

Appendix A. HL7 Socket Interface for VistA Integration

A.1 HL7 Message Transmission

HL7 messages are sent as the data load in a TCP socket. An outgoing socket, or client-initiated socket, is used for each new request; only the commit acknowledgement that acknowledges receipt of a request is returned in the socket. Section A.2 defines the socket usage. The HL7 message itself is encapsulated in a Minimal Lower Layer Protocol (MLLP) envelope as defined in the *HL7 Implementation Support Guide* published by the HL7 standards group. The envelope has a <SB>[144] at the beginning of the HL7 message and an <EB>[145] at the end of the message; the envelope ends with a <CR>[146] as shown in Figure 57. In the figure the text that starts with ***MSH*** and ends with ***<CR>*** is the HL7 message; the HL7 message is in ***italics***.

<SB>***MSH ….*** <CR><EB><CR>

Figure 57: MLLP Envelope for HL7 Message

A.2 Home Telehealth HL7 Function Transactions

The HL7 messages contain transactions to be processed by peer systems. Each transaction includes a request (for example ADT-A04, ORU-R01) and an acceptance of the request (commit acknowledgement). Table 94 defines the transaction sets. The transactions are discussed in the Home Telehealth function (section 3). The Function column lists the Home Telehealth function that is to be performed. The transactions are performed in the sequence listed in the table. The *Transaction Message/ACK* column lists the HL7 message and its associated commit acknowledgement. The transaction pair use the port listed in the *Vendor Server Port* column; both messages use the same port. The transaction originates in the system listed in the *Source/HL7 Application Column* and the system uses the application name to identify the sending application. Messages from incorrect applications are to be rejected using the application acknowledgement message (AR). The rejection message is defined in section 3.9; the error codes for application rejection messages are given in Table 79. The transaction's ultimate destination is the system listed in the *Destination/HL7 Application Column* and the

144 The <SB> (Start Block) is a single character sequence. The start block is the ASCII <VT> (vertical tab character) which has an encoded value of 0x0B.

145 The <EB> (End Block) is a single character sequence. The end block is the ASCII <FS> (file separator character) which has an encoded value of 0x1C.

146 The <CR> is the ASCII carriage character that has the encoded value of 0x0D.

destination system uses the application name to identify the receiving application. The source system sends information message portion of the transaction. The destination system and each intermediate VIE[147] sends a commit acknowledgement as the responsibility for the routing of the message is accepted. An application acknowledgement indicates that a peer application has processed the transaction; the application acknowledgement indicates either a successful processing of the message (AA) or unsuccessful processing of the message (AE/AR). The application acknowledgement is a new transaction; it is sent on the *outgoing* port and received on the incoming port.

Table 94: Home Telehealth Functions/HL7 Transactions

Function	Transaction Message/ACK	Source/ HL7 Application Name	Destination/ HL7 Application Name	Vendor Server Port[148]
Sign Up Activation	ADT-A04/ ACK (Cx)[149]	PIMS/ DG Home Telehealth[150]	Vendor server/ HTAPPL	Incoming
	QBP-Q22/ ACK (Cx)[151]	Vendor server/ MPI	MPI MPI	Outgoing
	RSP-K22/ ACK (Cx)	MPI/ MPI	Vendor server/ MPI	Incoming
	ACK (Ax)	Vendor server/ HTAPPL	PIMS/ DG Home Telehealth	Outgoing
Inactivation	ADT-A03/ ACK (Cx)	PIMS/ DG Home Telehealth[152]	Vendor server HTAPPL	Incoming

147 The Home Telehealth project received a waiver to bypass the use of the VIE infrastructure in June of 2007. All Home Telehealth HL7 traffic are to be sent directly to the destination system (MSH-6) and are not sent using the VIE infrastructure.

148 The ports are relative to the vendor server. The incoming port is the "listening port" of the vendor server. The outgoing port is the "listening port" of the VIE that services the vendor server.

149 The notation Cx is the acknowledgement code in MSA-1 (Table 76). The value CA indicates that the recipient has accepted the message. The value CR indicates that the recipient has rejected the message. The value CE indicates that the recipient has found an error in the message format.

150 The sign up message is accepted only from the PIMS application; the HL7 application name for the PIMS application is *DG Home Telehealth*.

151 The notation Ax is the acknowledgement code in MSA-1 (Table 76). The value AA indicates that the recipient application has accepted and processed the message. The value AR indicates that the recipient application has rejected the message. The value AE indicates that the recipient application has found an error in the message.

152 The inactivation message is accepted only from the PIMS application; the HL7 application name for he PIMS application is *DG Home Telehealth*.

Function	Transaction Message/ACK	Source/ HL7 Application Name	Destination/ HL7 Application Name	Vendor Server Port[148]
	ACK (Ax)	Vendor server HTAPPL	PIMS DG Home Telehealth	Outgoing
MPI update[153]	ADT-A31/ ACK (Cx)	MPIF TRIGGER/ MPIF TRIGGER	Vendor server MPI	Incoming
	ADT-A24/ ACK (Cx)	MPIF TRIGGER/ MPIF TRIGGER	Vendor server MPI	Incoming
	ADT-A43/ ACK (Cx)	MPIF TRIGGER/ MPIF TRIGGER	Vendor server MPI	Incoming
	ACK (Ax)	Vendor server/ MPI	MPI/ MPI	Outgoing
Observation	ORU-R01/ ACK (Cx)	Vendor server HDRVTLS	HDR HTH HDR	Outgoing
Progress note	MDM-T02 ACK (Cx)	Vendor server/ HTAPPL	TIU TIUHL7	Outgoing
	ACK (Ax)	TIU/ TIUHL7	Vendor server/ HTAPPL	Incoming

A.3 HL7 TCP Port Usage

The vendor server will perform a TCP listen on its incoming port[154]. The source system (MSH-4) or VIE opens a connection on this port when it has a message to deliver to the vendor server that uses the *incoming* port (Table 94). The source system or VIE may close the connection when it has received any required commit acknowledgement or reuse the connection for a new transaction. The destination system or VIE's incoming port[155] is the vendor server's outgoing port selector; the destination system or VIE will listen on that port for transactions from the vendor server. The vendor server opens a connection when it has a transaction to send that uses the *outgoing* port (Table 94). The vendor server may close the connection when the transaction is complete or reuse the connection for a new transaction. A transaction is complete when the

153 MPI updates are accepted only from the appropriate MP application; the HL7 application name for the MPI update application is *MPIF TRIGGER*.

154 The default port number for the vendor server's incoming port is 5121. A change order request is required to change this port number.

155 The default port number for the VIE is 8090. A change order request is required to change this port number.

commit acknowledgement has been received, if a commit acknowledgement has been requested. The vendor server will request a commit acknowledgement for every transaction that it sends. The commit acknowledgement is returned by the assigned VIE (Table 100).

Each VA system/vendor server interface (IP address and listening port) must be configured to receive either debug/test or production messages but not both. MSH-11 identifies the message as either debug/test or production (Table 10). Patients created via a debug/test Sign Up message must be maintained in records identified as debug/test. Data from debug/test records must only be sent through a debug/test interface. A message labeled "production" in MSH-11 must be rejected with an application reject (Table 79), if it is received through a debug/test interface. Patients created via a production Sign Up message must be maintained in records identified as production. Data from production records must only be sent through a production interface. A message labeled "debug" or "test" in MSH-11 must be rejected with an application reject (Table 79), if it is received through a production interface. GUIs should identify whether the data is from a production or debug/test record.[156] In general, there must be a clear separation between test and production data such that there will be no confusion.

A.4 Transmission Log

The vendor server must maintain a transmission log that can be exported to an external system. The exported file must be in a well-defined delimited format. The entries in the log describe events that the vendor system receives or processes. The entries in the log should contain a time stamp of the event and a description of the event. The events in the log should include (at a minimum) all messages received, all messages sent, the creation of sockets, the termination of sockets, and error conditions that occur during the use of a socket. In general, the log should contain as much information as practical for the diagnosis of problems dealing with communications with the VA systems via HL7.

A.4.1 Suggested Export Format

The suggested export consists of a set of text files. Each file represents one log entry. The export data can be moved via an FTP push by the vendor server or pull by the log processing system. All systems are on the VA Intranet. As an alternative, the export data may be staged on the Home Telehealth vendor share point. In that the exported data contains patient data, all storage locations supplied by the VA are secure and require access credentials.

The *HL7View* program is used by the Home Telehealth project team to summarize the vendor log entries. All of the log entries must be stored in a single directory. The program only processes text version of the log entries (.txt). Each log entry is contained in a single file. The

[156] See section 3.13 for the response to an unprocessable message.

file name describes the contents of the file and the time stamp of the log entry creation. The file name consists of two parts (part A and part B); the two parts are separated by a dash (-).[157] Part A (see Table 95) defines the event that caused the entry to be created. Part B is the time stamp of the event; the form of the time stamp is YYYY-MM-DD-HH-MM-SS-MS (a variation of the time stamp in Table 4). The content of the file is a text string supplying the details of the event. If the event is the creation, transmission, or receipt of an HL7 message, the text is the contents of the message. All segments of the message are to be included. In Table 95, the *required* column indicates whether the entry is required or optional in the exported data. The exported data must contain log entries for all required events.

Table 95: Suggested Log Entries

Event	Part A of file name	Comments	Required
HL7 message constructed	<*HL7 message type*> **built**	**ORUR01 built** indicates that the vendor server built an ORU-R01 message for transmission.	Yes
HL7 message received	<*HL7 message type*> **received**	**ADTA04** indicates that the vendor server received an-ADT-A04 message.	Yes
HL7 ORU-R01 message sent	<*HL7 message type*> **sent**	**ORUR01 sent** indicates that the vendor server sent an ORU-R01 message.	Yes
TCP socket listen	**TCPIP listen**	Vendor server is listening for incoming connections from the local VIE. The text contains the port number	Optional
TCP socket open	**TCPIP open**	Vendor server opened a new connection to the local VIE. The text contains the port number.	Optional
TCP socket accept	**TCPIP accept**	Vendor server accepted a new connection from the local VIE. The text contains the port number.	Optional
TCP socket close	**TCPIP close**	Vendor server closed a connection to the local VIE. The text contains the port number.	Optional
TCP socket terminate	**TCPIP terminated**	The local VIE closed a connection to the vendor server. The text contains the port number.	Optional
Timer expired	**Timer expiration**	A timer has expired. The text **CA timer expiration** or **AA timer expiration**. CA timer expiration indicates that an expected CA, CE, or CR was not	Optional

[157] An example of a log entry file name is: "ACK Received -2006-01-05-11-57-23-636.txt"; this file would contain an HL7 acknowledgement message (either a message or application acknowledgement).

Event	Part A of file name	Comments	Required
		received within the expected time period. AA timer expiration indicates that an AA, AE, or AR was not received within the expected time period.	

A.4.2 Manual Retransmission of Log Entry Data

The vendor server administrator must have a method to restart the transmission of a message that is stored in the transmission log. This would normally be accomplished by the initiation of the retransmission process.

A.5 Message Retransmission and Acknowledgement

A.5.1 Overview

Messages that do not receive an acknowledgement within a specified timeout period (see sections A.5.2.1and A.5.3.1) are to be retransmitted by the sending system. A retransmission is the sending of an exact copy of the message; no modifications are to be made to the message text. The receipt of an acknowledgement terminates the retransmission process. The retransmission process includes multiple retransmission attempts followed by an action such as an alert or a port reset with more retransmission attempts.

Messages received by a system are to be promptly acknowledged when the message includes an acknowledgement request in the MSH segment.

The transmission log shall retain a record of all messages and the corresponding actions.

A.5.2 Commit Acknowledgement

The commit acknowledgement only indicates that the message has been received by the local VIE; it does not indicate that the message has been delivered to the receiving system. The commit acknowledgement is a handshake between a system and its local VIE. An acceptance of the message[158] indicates that the message will be routed to its destination system by a VIE or processed by the appropriate application. A rejection of the message[159] indicates that the message will not be routed to its destination by a VIE or will not be processed. All messages

[158] Message acceptance is indicated by an MSA-1 field containing a CA.

[159] Message rejection is indicated by an MSA-1 field containing either a CR or a CE.

must request a commit acknowledgement (AL in MSH-15), except for a commit acknowledgement message (ACK in MSH-9.1 and CA, CE, or CR in MSA-1).

A.5.2.1 Sending Messages

The sending system must allow at least 30 seconds[160] for the receipt of a commit acknowledgement (CA, CE, or CR**)**. If the destination system or local VIE does not acknowledge a message after five retransmissions[161], the sending system should reset[162] the TCP socket and start the retransmission process again. If the local VIE does not acknowledge the message after the reset of the TCP socket and the following five retransmissions, the message should be stored such that the retransmission process can be initiated later, an entry should be made in the transmission log and an alert should be generated for the system administrators. After a retransmission failure, the retransmission process should be automatically restarted after 4 hours[163]. Table 96 lists the steps that are to be followed in the sending of a message. The sending system must have the capability to allow the administrators to resend any message that has an entry in the transmission log.

Table 96: Message Transmission Process

Message	Action
Initial message	All messages must request commit acknowledgement (AL in MSH-15) except commit acknowledgement messages.
Receipt of positive commit acknowledgement (CA)	Message is to be queued for receipt of application acknowledgement (if requested)
Receipt of negative commit acknowledgement (CE/CR)	1. Alert generated support group. 2. Message discarded.[164]

160 The time value must be modifiable.

161 The actual retransmission count must be modifiable.

162 A reset of a TCP socket is accomplished by closing the currently open socket and opening a new socket to the same destination.

163 The time value must be modifiable.

164 If the message requested an application acknowledgement in MSH-16, the application acknowledgement is to be cleared with a self-generated AR.

Message	Action
No receipt of commit acknowledgement (30 second timeout)	Message is retransmitted
Message retransmission fail (after five retries)	1. TCP socket reset to allow for hung TCP socket 2. Message is retransmitted
No receipt of commit acknowledgement (30 second timeout)	Message is retransmitted
Message retransmission fail (after five retries)	Message is retransmission process is restarted after a 4 hour delay to allow for infrastructure recovery

A.5.2.2 Receiving Messages

If a system receives a message that does not request a commit acknowledgement in MSH-15, it must not generate an acknowledgement message. When a system receives a message that does request a commit acknowledgement, a commit acknowledgement (CA, CE, or CR) must be returned within 5 seconds[165]. Table 97 defines the conditions and actions to be performed when a message is received.

Table 97: Commit acknowledgement Process

Type	Criteria	Action
Unrecognizable message	No MSH, or MSH does not contain decipherable sending application, receiving application, message control ID, or accept acknowledgement type	Discard message Place appropriate entry in transmission log
Unacceptable message	MSH does not identify the receiving system in MSH-6.1	Send message rejection (CR) using appropriate error code from Table 79, if the message requests an acknowledgement in MSH-15 Place an appropriate entry in the

[165] The expectation is that the commit acknowledgement is generated as soon as the validation criteria have been met or failed.

Type	Criteria	Action
		transmission log
Acceptable message	MSH 6.1 identifies the receiving system	Send message acceptance (CA) Place an appropriate entry in the transmission log

A.5.3 Application Acknowledgements

The application acknowledgement indicates that the transaction contained in a message has been received and processed by the receiving application. The application acknowledgement is a handshake between the sending application and the receiving application. A positive acknowledgement of the message[166] indicates that the transaction contained in the message has been successfully processed by the receiving application. A negative acknowledgement of the message[167] indicates that the transaction contained in the message could not be processed by the receiving application.

A.5.3.1 Sending Transactions

The sending system must allow at least 15 minutes[168] for the receipt of an application acknowledgement (AA, AE, or AR**)**. If the receiving system does not acknowledge a message after ten retransmissions[169], sending system will store the message, an entry will be made in the transmission log and an alert should be generated for the system administrators. After a retransmission failure, the retransmission process should be automatically restarted after 4 hours[170]. Table 98 lists the steps that are to be followed in the sending of a message containing a transaction. The sending system must have the capability to allow the administrators to resend any message with an entry in the transmission log. All must request an application acknowledgement (AL in MSH-16).

Table 98: Transaction Transmission Process

Message	Action
Initial message	All messages must request application acknowledgement

166 Application acceptance is indicated by an MSA-1 field containing an AA.

167 Application rejection is indicated by an MSA-1 field containing either an AR or an AE.

168 The time value must be modifiable.

169 The actual retransmission count must be modifiable.

170 The time value must be modifiable.

Message	Action
	(AL in MSH-16) except commit and application acknowledgement messages.
Receipt of positive application acknowledgement (AA)	The message processing is complete.
Receipt of negative application acknowledgement (AE/AR)	1. Alert generated support group. 2. Message discarded.
No receipt of application acknowledgement (15 minute timeout)	Message is retransmitted
Message retransmission fail (after ten retries)	Message is retransmission process is to be restarted after a 4 hour delay to allow for infrastructure recovery

A.5.3.2 Receiving Messages

If a system receives a message that does not request an Application Acknowledgement in MSH-16, it must not be acknowledged. When a system receives a message that does request an application acknowledgement, an application acknowledgement (AA, AE, or AR) must be returned within 5 minutes[171] of the completion of the processing (successful or unsuccessful processing). Table 99 defines the conditions and actions to be performed when a message is received.

Table 99: Application Acknowledgment Process

Type	Criteria	Action
Unacceptable transaction	MSH-5 does not contain proper receiving application, MSH-9 does not contain proper message type, MSH-11 does not contain the proper processing ID, or MSH-12 does not contain proper HL7 version[172]	1. Send application rejection (AR) using appropriate error code from Table 79, if the message requests an acknowledgement in MSH-16 2. Place appropriate entry in transmission log
Invalid	Message body does not contain	1. Send application rejection (AR)

[171] The expectation is that the application acknowledgement is generated as soon as the processing criteria have been met or failed.

[172] See section 3.13 for the response to an unprocessable message.

Type	Criteria	Action
transaction	appropriate date for the application or the data causes a data safety issue	using appropriate error code from Table 79 (see section 3.9), if the message requests an acknowledgement in MSH-16 2. Place an appropriate entry in the transmission log
Valid transaction	Application successfully processed the message	1. Send application processing successful (AA) 2. Place an appropriate entry in the transmission log

All messages received with the same control ID in MSH-10 and facility in MSH-4.1 are to be considered duplicate messages. If an application receives a duplicate message that does not request an application acknowledgement, it is to be silently discarded with appropriate entries in the transmission log. If a duplicate message is received that requests an application acknowledgement, the original application acknowledgement is to be retransmitted.

A.6 Port Throttling

Commit acknowledgement is used to throttle the traffic on a system's *outgoing* port. Systems should not send a new transaction, if the previous transaction has not received a commit acknowledgement or completed the message retransmission algorithm (section A.5.2.1). Retransmission of transactions that have not received a commit acknowledgement takes precedence over new transactions.

A.7 Home Telehealth HL7 Integration Test Environment (ITL)

Figure 58 depicts the test environment used for the integration testing of the Home Telehealth systems. The vendor servers are on the right side of the figure. VistA systems are on the left side of the figure. The core VA systems (HDR and MPI) are in the center of the diagram. The infrastructure is supplied by the VistA Interface Engines (VIEs). All traffic is sent to a VIE by a source system for delivery to the destination (peer system). The VIE will send a commit acknowledgement (if requested) for all messages received. The VIE will expect a destination system to send a commit acknowledgement for all messages received (if the acknowledgement is requested in the MSH header).

The test environment uses system in the Austin Automation Center (AAC), the Silver Spring OIFO, and the Bay Pines Medical Center. The environment defines a set of test patients and systems that support those test systems. The production environment will operate in a similar manner; the anticipated changes are system addresses and VIEs (Table 100).

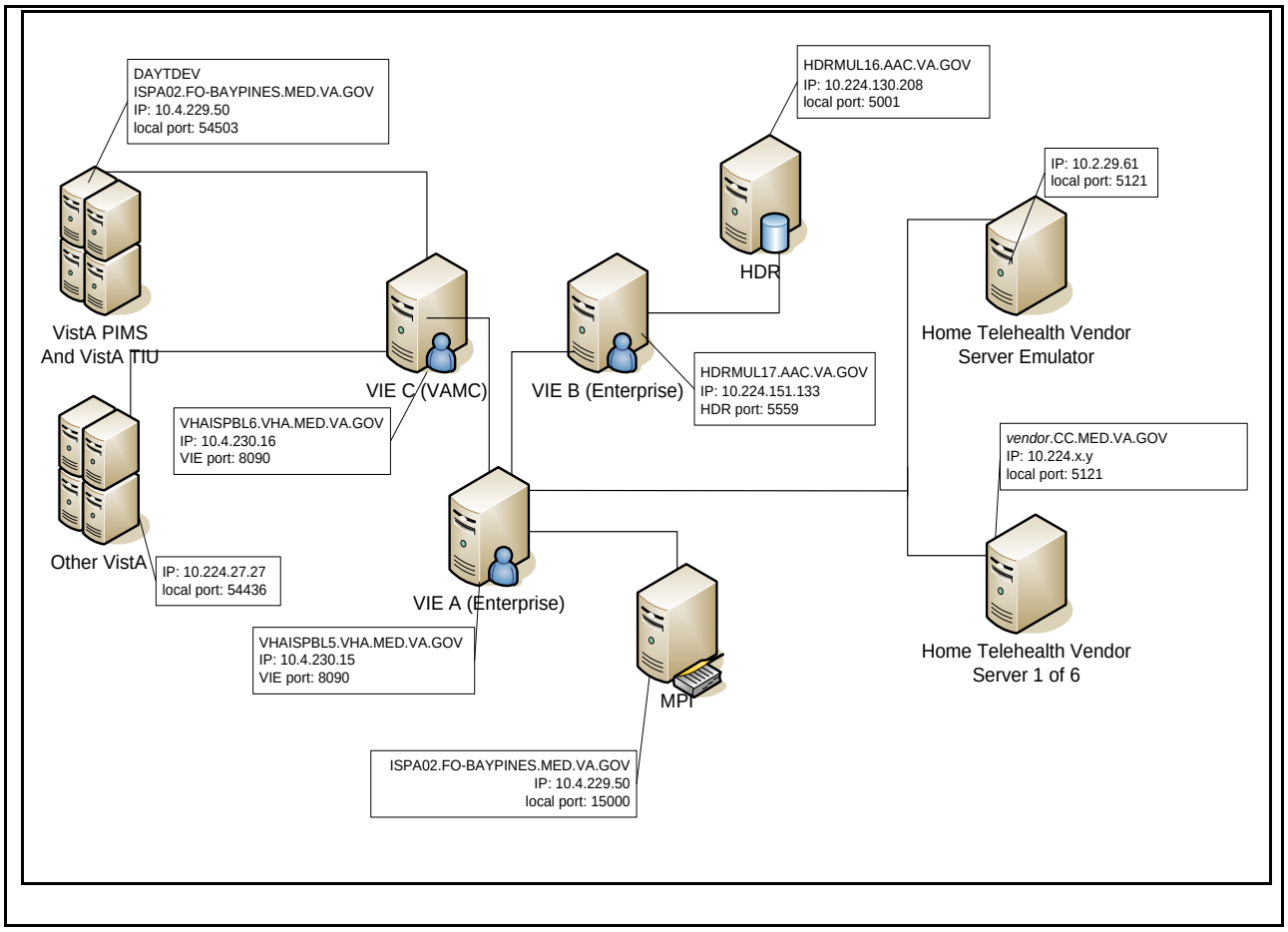

Figure 58: Home Telehealth Integration Test Environment

Table 100 lists the VIE assignments used in the integration test environment.

Table 100: VIE Assignments[173]

System	Listen Port	Assigned VIE	Listen Port
Vendor Emulator	5121	vhaispbl5.vha.med.va.gov (IP 10.4.230.15)	8090
Vendor Server	5121	vhaispbl5.vha.med.va.gov (IP 10.4.230.15)	8090
MPI	15000	vhaispbl5.vha.med.va.gov (IP 10.4.230.15)	8090
HDR	5001	vhaispbl5.vha.med.va.gov (IP 10.4.230.15)	5559
VistA (PIMS)	54503	Vhaispbl6.vha.med.va.gov (IP 10.4.230.16)	8090
VistA (TIU)	54503	Vhaispbl6.vha.med.va.gov (IP 10.4.230.16)	8090

Table 101 lists the assignments VA systems used in the integration test environment.

173 At the current time (2008), the Home Telehealth is not actively using the VIE infrastructure.

Table 101: VA ITL System Assignments

System	IP[174]	DNS	Port
Vendor Emulator		ITL.HL7.EMULATOR.CC.MED.VA.GOV	5121
Vendor		ITL.HL7.<vendor name>.CC.MED.VA.GOV	5121
MPI		ISPA02.FO-BAYPINES.MED.VA.GOV	15000
HDR		VAHDRSVWLS01.AAC.VA.GOV	5001
VistA (552)[175]		STLSQA.FO-BAYPINES.MED.VA.GOV	54503
VistA (613)		613.CC.MED.VA.GOV	5000
VistA (657)		657.CC.MED.VA.GOV	5000
Census		ITL.HL7.NHDB.CC.MED.VA.GOV	5001
Survey		ITL.HL7.NHDB.CC.MED.VA.GOV	5001

A.8 Home Telehealth Production Environment

The Home Telehealth Production Environment diagram is similar to the ITL environment. It is described in a separate document that is distributed to each system when it is ready to support production. Table 102 lists the assignments VA systems used in the production environment.

Table 102: VA Production System Assignments (no VIE)

System	Facility	DNS	Port
Monitor	200T3	VAWW.HL7.SILVERSPRING.MONITOR.CC.MED.VA.GOV	5121
Vendor	200Tx	VAWW.HL7.<vendor name>.CC.MED.VA.GOV	5121
MPI	200M	MPI-AUSTIN.MED.VA.GOV	5000
HDR	200HD	HDRCLUSA.AAC.VA.GOV	5031
VistA	xxx	HL7.<MSH-4.2>	5000
Census	688HT	VAWW.HL7.NHTDB.CC.MED.VA.GOV	5000
Survey	688HT	VAWW.HL7.NHTDB.CC.MED.VA.GOV	5000

[174] Unless actually specified in this table all ITL references should be made using the DNS.

[175] Facility 552 in the Integration Test Lab must be specially configured since it does not listen on the standard VistA port (5000). All other VistA systems listen on port 5000 and do not require special configuration.

Appendix B. Socket Interface without VistA Interface Engine

The TCP/IP socket protocol that is used when there is no VIE is based upon the protocol described in Appendix A with the difference described in this section.

In general, without the VIE all communications requires a TCP socket that is directly connected to the peer application. While this affects both the incoming and outgoing TCP ports, it does not affect the actual messages that sent or received nor the generation and processing of message or application acknowledgments. The incoming and outgoing TCP port usage is defined in Table 94

B.1 Outgoing TCP Ports

Each message that is to be sent on an outgoing port will need a direct socket connection to the destination application system since the VIE will not be used to route the message. The socket is to be opened using a DNS name. Selected applications are national applications and other applications are VAMC based. Table 103 defines the listening port and DNS definition for each application. In this mode of operation, it is appropriate that the socket be closed when the commit acknowledgement is received or when the message retransmission algorithm has reached a failure point. Configuration information is also published in ITL and Production Configuration documents found in each vendor's SharePoint.

Table 103: DNS and Outgoing Port

System	Port[176]	DNS Definition (HL7 Listener)
MPI	15000 5000	ISPA02.FO-BAYPINES.MED.VA.GOV MPI-AUSTIN.MED.VA.GOV
HDR	TBD TBD	TBD TBD
Survey database	5001 5000	ITL.HL7.NHDB.CC.MED.VA.GOV VAWW.HL7.NHDB.CC.MED.VA.GOV
Census database	5001 5000	ITL.HL7.NHDB.CC.MED.VA.GOV VAWW.HL7.NHDB.CC.MED.VA.GOV
VistA (PIMS)	54503 5000	I10.4.230.253 ADT-A04 that registered the patient (sign up/activation transaction)[177]
Vendor[178]	5121	ITL.HL7.<vendor name>.CC.MED.VA.GOV

[176] The first listed port is for the ITL; all messages sent to an ITL port must have a message processing type of "T". The second listed port is for production; all message sent to a production port must have a message processing type of "P".

[177] See section B.1.2 for the DNS of production HL7 listener on VistA system in a VAMC.

System	Port[176]	DNS Definition (HL7 Listener)
	5121	VAWW.HL7.<vendor name>.CC.MED.VA.GOV
Network monitor	(n/a)[179] 5121	 VAWW.HL7.SILVERSPRING.MONITOR.CC.MED.VA.GOV[180]

B.1.1 National Applications

The national applications are the MPI, the HDR, the survey database and the census database. These systems use the DNS names specified in the production configuration documents. Each system has a unique DNS. The DNS for these systems must be preconfigured.

B.1.2 VAMC Applications

The VistA applications are based at individual VAMCs. Each VistA system DNS can be recovered from HL7 messages sent by the VistA system. Each patient uses the VistA applications at the VAMC that sends the signup/activation message (ADT-A04). When an ADT-A04 is received to establish a patient, the DNS name in MSH-4.2 must be kept so that sockets can be opened for messages that relate to the patient. The content of MSH-4.2 is the DNS for the VistA facility, not the HL7 listener for the Vista facility. The DNS for the VistA HL7 listener is **HL7.<MSH-4.2>**; for example, the DNS for the Washington VAMC HL7 listener is **HL7.WASHINGTON.MED.VA.GOV**. The Washington VAMC places **WASHINGTON.MED.VA.GOV** in MSH-4.2.

B.2 Incoming TCP Ports

There must be a listener active on the incoming TCP port at all times, since a new connection can be created by any of the 127 VAMC or other systems. There is no other impact on the incoming port.

178 See section Table 82 for the production Home Telehealth vendor HL7 listener DNS. The ITL DNS use the same vendor name.

179 The network monitor does not monitor the ITL.

180 The network monitor uses the DNS of VAWW.HL7.AMDTELEMED.CC.MED.VA.GOV when monitoring VA systems. The DNS of VAWW.HL7.SILVERSPRING.MONITOR.CC.MED.VA.GOV is used when monitoring vendor systems.

Appendix C. Data Quality Criteria

C.1 Time

All time values used to create HL7 message time stamps must be traceable to NIST time source; the VA timeservers are traceable to the NIST time source. A time value submitted by an external system that is not traceable to a NIST time source is to be considered unreliable and cannot be used in an HL7 message.

C.2 Patient Identification

Patients that are not VistA Integrated are identified by SSN. The SSN is to be used as an index into the patient database. If the patient name and/or date of birth are available, each should be used to verify that the selected patient is the correct patient. If neither is available, the patient selected by the SSN is to be considered the correct patient. If only the name is available, the name is used to validate the patient selection. Only the first, middle and last name components are to be used to verify the patient identity[181]. If any component is missing (is null) in either the VA supplied PID or the vendor database, then the component is not to be used in the verification.

Patients that are VistA Integrated are identified by ICN. The ICN is to be used as an index into the patient database. If the SSN, DFN from the sign up facility are available, each should be used to verify that the selected patient is the correct patient. If one or more are not available, the remaining set is used to validate the patient. If only the DFN from the sign up facility is available, the patient selection is to be considered valid if there is a DFN match. If the only DFN available is a DFN from another VA facility, the DFN is to be ignored. No other fields are to be used to verify the patient identity.

The patient identity in a message from the MPI is verified by the ICN, DFN and SSN. For example, a sign up request (ADT-A04) requires that a registration message (QBP-Q22) be sent to the MPI. The verification that the response message (RSP-K22) is for the same patient is that the ICN, DFN and SSN are the same. The ICN must be present in the response, the DFN and SSN are optional; if either the DFN or SSN is not present, the comparison for the component is not to be performed.

Every message from the MPI should be used to correct the patient identity, name and demographics. A sign up message (ADT-A04) from VistA can update the patient address, phone number, care coordinator, and consult number.

[181] The verification is accomplished by comparing the standardized form of each name. The standardized form of a name is given in Appendix L.

Appendix D. Use of VA Facility Number for a Patient Sign Up/Activation

D.1 VA Facility Number Background

VA tracks workload in different ways. Some facilities group workload at a high level, others at a low level. This guide will allow the association of a Home Telehealth patient with a facility so that VA can choose the best solution for the circumstance.

Three-digit facility numbers are assigned to VistA systems; five-character sub-facility numbers are assigned to servicing locations associated with a VistA system. A VAMC (or VA facility) may have sub facilities such as RBOCs, CBOCs, or storefront location. The sub facility number is of the form <VAMC facility number><remote location suffix>. For example, the Omaha VAMC (facility 636) has a remote facility Iowa City with the facility number of 636A8. All *MSH* segment data will associate the message with facility 636. No HL7 transaction (HL7 message) will ever have data in the *MSH* segment identifying that the message is associated with facility 636A8. No patient in an HL7 message will ever be identified as having a medical record on facility 636A8; all patient data will be associated with facility 636. The care coordinator's work location may be 636A8; the work location is in the HL7 sign up transaction (*Servicing Facility* field of the *PV1* segment *PV1-39*).

D.2 Use of Facility Number to Place Patient in a Servicing Location

If a patient is to be associated with a remote location, the *Servicing Facility* field of the *PV1* segment in the *ADT-A04* is to be used to make the association. No field of the *MSH* or *PID* is to be used by the Home Telehealth vendor to associate a patient with a facility. The business rules for the association of a patient with a facility number are given in Table 91. The rules define that a patient is to be associated with the facility in the *Servicing Facility* field. If the facility in the servicing field is not supported by the vendor and the facility is a sub-facility (five-character facility number), the parent facility is to be used. If a parent facility is not supported, the request is to be rejected.

Table 104: Patient Association with a Facility Number Business Rules

Rule	Facility	Rule	Example1	Example2
1	*Servicing Facility* (from PV1-39)	Facility number in *Servicing Facility* field is supported by the vendor. Sign Up request is to be accepted and patient associated with the facility number in the *Servicing Facility* field.	636A8 is supported, accept transaction request	636 is supported, accept transaction request
2	Parent facility of *Servicing Facility* in	Parent facility number (first three characters of the *Servicing Facility* field) is supported by the vendor.	636A8 is not supported but 636 is, use 636, accept	(rule not used)

Rule	Facility	Rule	Example1	Example2
	PV1-39	Sign Up request is to be accepted and patient assigned to parent of facility in Servicing Facility.	transaction request	
3	*Servicing Facility* and parent facility	Neither the facility number in *Servicing Facility* field nor its parent facility number is supported by the vendor.	636A8 is not supported and 636 is not supported, reject the request	636 is not supported, reject the request

Appendix E. CDS Interface to RDV

(This appendix has been deleted.)

Appendix F. CDS Interface to VistA Web

(This appendix has been deleted.)

Appendix G. Alignment of the VistA and Vendor Primary Care Coordinator

The primary Care Coordinator for an individual patient is defined in the Sign Up/Activation message (ADT-A04). The field PD1-4 identifies the individual. The *ID number* component (Table 24) contains the unique VistA Identifier for the care coordinator. The Care Coordinator's identifier is a tuple consisting of the VistA Identifier and the VistA facility number. The number is unique within the facility that generated the message (MSH-4.1). The vendor must supply a method to align the VistA Care Coordinator with the list of Care Coordinators in the vendor system. This can initially be performed by an administrator of login credentials manually. Once the linkage has been made, the Care Coordinator's identifier should be associated with the login credentials and can then be used to assign a primary Care Coordinator in the vendor desktop.

Appendix H. Census Submission XML Format

The description of the XML (XSD) for the Census submission in the OBX segment of the HL7 message is illustrated in Figure 59. . As a historical note the weekly census submission was originally submitted as an Excel spreadsheet. This genealogy should explain the strange XML and duplication between the HL7 message segments and the XML in the OBX

segment.[182]

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema id="HTCensus" xmlns="" xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:msdata="urn:schemas-microsoft-com:xml-msdata">
  <xs:element name="Table">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="version" type="xs:string" />
        <xs:element name="vendor_number" type="xs:string" />
        <xs:element name="vendor_name" type="xs:string" />
        <xs:element name="date_submitted" type="xs:string" />
        <xs:element name="report_start_date" type="xs:string" />
        <xs:element name="report_end_date" type="xs:string" />
        <xs:element name="patient_ssn" type="xs:string" />
        <xs:element name="patient_icn" type="xs:string" minOccurs="0" />
        <xs:element name="vendor_mrn" type="xs:string" />
        <xs:element name="home_dev_model" type="xs:string" />
        <xs:element name="home_dev_serial" type="xs:string" />
        <xs:element name="name_first" type="xs:string" />
        <xs:element name="name_mi" type="xs:string" minOccurs="0" />
        <xs:element name="name_last" type="xs:string" />
        <xs:element name="patient_dob" type="xs:string" />
        <xs:element name="level_of_care" type="xs:string" />
        <xs:element name="enrollment_date" type="xs:string" />
        <xs:element name="disenrollment_date" type="xs:string" minOccurs="0" />
        <xs:element name="activation_date" type="xs:string" />
        <xs:element name="inactivation_date" type="xs:string" minOccurs="0" />
        <xs:element name="facility_number" type="xs:string" />
        <xs:element name="compliance" type="xs:string" />
        <xs:element name="rr_res" type="xs:string" />
        <xs:element name="rr_exp" type="xs:string" />
        <xs:element name="data_age" type="xs:string" />
        <xs:element name="care_coordinator" type="xs:string" minOccurs="0" />
        <xs:element name="program_name" type="xs:string" />
        <xs:element name="Table" minOccurs="1" maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="modality" type="xs:string" />
              <xs:element name="modality_name" type="xs:string" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
 <xs:element name="HTCensus" msdata:IsDataSet="true" msdata:UseCurrentLocale="true">
    <xs:complexType>
      <xs:choice minOccurs="1" maxOccurs="1">
        <xs:element ref="Table" />
      </xs:choice>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

Figure 59: XML XSD for Census Submission

[182] The duplication data between the XML and HL7 message segments will be corrected in the future.

The data elements collected as part of the Census submission are listed in Table 105. Each data element is mapped onto a Census data element required by the clinical owner of the system. The clinical document defines the business rules that are used to collect the information for each required data item. The clinical definition document is listed in section 8.

Table 105: Data Element Description for Census Submission[183]

XSD Element name	(requirement)	Description	Data type	Example
version	Mandatory	Census specification version	String	(OBX-3.2)
vendor_number	Mandatory	Vendor facility number		Table 82
vendor_name	Mandatory	Vendor facility name		Table 82
date_submitted	Mandatory	Date the census was sent	Date[186]	2004-09-07
report_start_date	Mandatory	Start date for the census submission	Date	2004-09-01
report_end_date	Mandatory	End date for the census submission	Date	2004-09-07
patient_ssn	Mandatory	Patient SSN for use as database index (secondary – if ICN is not available)		C
patient_icn	Mandatory	Patient ICN for use as database index (primary)		Table 4

[183] Table will be updated in the next release to align with the current clinical specification for the census report.

[186] Format for date is YYYY-MM-DD.

vendor_mrn	Mandatory	Patient's medical record number in the vendor's database	String	
home_dev-model	Mandatory			
home_dev_serial	Mandatory			
name_first	Mandatory	Patient's first name		Table 4
name_mi	Optional	Patient's middle initial or middle name		Table 4
name_last	Mandatory	Patient's last name		Table 4
patient_dob	Mandatory	Patient's date of birth	Date	2004-09-01
level_of_care	Mandatory			
enrollment_date	Mandatory	Date patient entered the program	Date	2004-1-31
disenrollment_date	Optional	Date patient left the program	Date	2004-6-31
activation_date	Mandatory			

inactivation_date	Optional
facility_number	Mandatory
compliance	Mandatory
rr_res	Mandatory
rr_exp	Mandatory
data_age	Mandatory
care_coodinator	Optional
program_name	Mandatory
modality	Mandatory
modality_name	Mandatory

Appendix I. DMP Patient Response XML Format

The description of the XML (XSD) for the DMP submission in the OBX segment of the HL7 message is illustrated in Figure 60.

```
<?xml version="1.0" standalone="yes"?>
<!-- define the name space for names in this schema
```

```
     name space names have a prefix htNS
     type names have a prefix htType
     element tags for xml have the prefix dmp
     initial verison of the DMP response message
             defines the generic response and the generic scored response

     elements  attribute
     dmpResponse (root)
      htNSdmpResponse - namespace for names within this schema
      xsi - location of the W3 org schema
     dmpGenericResponse - non-standardized DMP response without scoring
     dmpGenericResponseWithScore - non-standardized DMP response with scoring
     xmlVersion - encoding version
                  should match the version of this schema
                  version attribute of root - schema tag
     dmpVendorFacility - vendor facility number 200Tx, 200T1 - 200T8
     dmpVendorName - name of the vendor (no bound)
     dmpVendorMRN - tuple (index:dmpVendorFacility)
     dmpTitle - standardized (specific list) or non-standardized
     dmpVersion - DMP revision
     dmpProgramName - care program name
     dmpDeviceName - collection device (IVR, home unit, ...)
     dmpScheduledDate - date that the patient should have used the DMP question set
     dmpCompletedDate  - date that the patient actually used the DMP question set
     dmpResponseStatus - status of the submission
                         (completed, partially completed, no response, ...)
     dmpQuestionsAndAnswers - question and answer area
     dmpQuestionsAndAnswersWithScore - question, answer and score area
     dmpQuestionAndAnswer - individual question and answer area
     dmpQuestionAndAnswerWithScore - individual question, answer and score area
     dmpQuestionNumber - question that is being answered
     dmpAnswer - the answer
     dmpScore - the triage score for the answer
-->
<xs:schema
  xmlns:htNSdmpResponse="HT_DMP_RESPONSE"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:msdata="urn:schemas-microsoft-com:xml-msdata"
  targetNamespace="HT_DMP_RESPONSE"
  elementFormDefault="unqualified"
  attributeFormDefault="unqualified"
  version="1.0">
  <xs:element name="dmpResponse" type="htNSdmpResponse:htTypeResponseForm"
              msdata:IsDataSet="true">
    <xs:unique name="questionsKey">
      <xs:selector xpath="*/dmpQuestionsAndAnswers/dmpQuestionAndAnswer"/>
      <xs:field xpath="dmpQuestionNumber"/>
    </xs:unique>
  </xs:element>
  <xs:complexType name="htTypeResponseForm">
    <xs:choice>
      <xs:element name="dmpGenericResponse" type="htNSdmpResponse:htTypeGenericResponse"/>
      <xs:element name="dmpGenericResponseWithScore"
                  type="htNSdmpResponse:htTypeGenericResponseWithScore"/>
    </xs:choice>
  </xs:complexType>
  <xs:complexType name="dmpResponseHeader">
    <xs:sequence>
      <xs:element name="xmlVersion" type="xs:string"/>
      <xs:element name="dmpVendorFacility" type="xs:string"/>
      <xs:element name="dmpVendorName" type="xs:string"/>
      <xs:element name="dmpVendorMRN" type="xs:string"/>
      <xs:element name="dmpTitle" type="xs:string"/>
      <xs:element name="dmpVersion" type="xs:string"/>
      <xs:element name="dmpProgramName" type="xs:string" minOccurs="0"/>
      <xs:element name="dmpDeviceName" type="xs:string" minOccurs="0"/>
      <xs:element name="dmpScheduledDate" type="xs:date" nillable="true" minOccurs="0"/>
```

```
    <xs:element name="dmpCompletedDate" type="xs:dateTime"/>
    <xs:element name="dmpResponseStatus" type="htNSdmpResponse:htTypeAcceptance"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="htTypeGenericResponse">
  <xs:complexContent>
    <xs:extension base="htNSdmpResponse:dmpResponseHeader">
      <xs:sequence>
        <xs:element name="dmpQuestionsAndAnswers" minOccurs="0">
          <xs:complexType>
            <xs:sequence>
              <xs:element
                 name="dmpQuestionAndAnswer"
                 type="htNSdmpResponse:htTypeUnscoredQuestionAndAnswer"
                 minOccurs="1"
                 maxOccurs="8"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="htTypeGenericResponseWithScore">
  <xs:complexContent>
    <xs:extension base="htNSdmpResponse:dmpResponseHeader">
      <xs:sequence>
        <xs:element name="dmpQuestionsAndAnswersWithScore" minOccurs="0">
          <xs:complexType>
            <xs:sequence>
              <xs:element
                 name="dmpQuestionAndAnswerWithScore"
                 type="htNSdmpResponse:htTypeScoredQuestionAndAnswer"
                 minOccurs="1"
                 maxOccurs="8"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="htTypeUnscoredQuestionAndAnswer">
  <xs:sequence>
    <xs:element name="dmpQuestionNumber" type="htNSdmpResponse:htTypeQuestionType"/>
    <xs:element name="dmpAnswer" type="htNSdmpResponse:htTypeAnswerType"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="htTypeScoredQuestionAndAnswer">
  <xs:sequence>
    <xs:element name="dmpQuestionNumber" type="htNSdmpResponse:htTypeQuestionType"/>
    <xs:element name="dmpAnswer" type="htNSdmpResponse:htTypeAnswerType"/>
    <xs:element name="dmpScore" type="htNSdmpResponse:htTypeAnswerScoreType"/>
  </xs:sequence>
</xs:complexType>
<xs:simpleType name="htTypeAcceptance">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Accepted"/>
    <xs:enumeration value="Refused"/>
    <xs:enumeration value="Delayed"/>
    <xs:enumeration value="Disenrolled"/>
    <xs:enumeration value="Refused Time out"/>
    <xs:enumeration value="Complete"/>
    <xs:enumeration value="Incomplete"/>
    <xs:enumeration value="Not submitted"/>
  </xs:restriction>
</xs:simpleType>
```

```
  <xs:simpleType name="htTypeQuestionType">
    <xs:restriction base="xs:integer">
      <xs:minInclusive value="1"/>
    </xs:restriction>
  </xs:simpleType>
  <!--  0 indicates that the question was not answered
        1 - 5 are the five possible answers
   -->
  <xs:simpleType name="htTypeAnswerType">
    <xs:restriction base="xs:integer">
      <xs:minInclusive value="0"/>
      <xs:maxInclusive value="5"/>
    </xs:restriction>
  </xs:simpleType>
  <!--  0 indicates that the question was not answered
        1 - 3 are the three possible scores (low/medium/high)
   -->
  <xs:simpleType name="htTypeAnswerScoreType">
    <xs:restriction base="xs:integer">
      <xs:minInclusive value="0"/>
      <xs:maxInclusive value="3"/>
    </xs:restriction>
  </xs:simpleType>
</xs:schema>
```

Figure 60: DMP Patient Response XSD

The data elements collected as part of the DMP patient response are listed in Table 106.

Table 106: Data Element Description for DMP Patient Response Submission

XSD Element	Description	Data type	Example
dmpGenericResponse	Identifies that the DMP does not have scoring		
dmpGenericResponseWithScore	Identifies that the DMP does have scoring		
xmlVersion	XML formation version (XSD)	String	(OBX-3.1)
dmpTitle	Standard DMP title	String	(OBX-3.3)
dmpVersion	Standard DMP version	String	(OBX-3.1)
dmpVendorFacility	Vendor facility number	String	Table 82
dmpVendorName	Vendor name	String	Table 82
dmpVendorMRN	Vendor medical record	String	

XSD Element	Description	Data type	Example
	number		
dmpScheduledDate	Date the DMP was scheduled to be taken	Date[187]	2004-09-01
dmpCompletedDate	Date and time that the DMP was completed	Date & Time[188]	2002-10-10T13:00:00-05:00
dmpDeviceName	Device that presented DMP	String	IVR
dmpResponseStatus	Five standard values that describe the state of the DMP patient responses being delivered. Identifies if patients choose to respond to the DMP or the reason that they did not.	One of five values: “Accepted” “Refused” “Delayed” “Disenrolled" “Refused-Time-out”	Accepted
dmpQuestionsAndAnswers	(The set of questions that had responses)	(no attributes – data is a set of dmpQuestionAndAnswer elements)	
dmpQuestionAndAnswer	(The answer to an individual question)	(no attributes – data is a dmpQuestionNumber element and a dmpAnswer element)	

187 Format for date is YYYY-MM-DD.

188 Format for date/time is YYYY-MM-DDThh:mm:ss-UTC offset in 24 hour clock format (-05:00 would be eastern time zone). Example is 2002-10-10T13:00:00-05:00.

XSD Element	Description	Data type	Example
dmpQuestionAndAnswerWithScore	(not used for this release)[189]		
dmpQuestionNumber	Number of the DMP question that was answered	Integer	5
dmpAnswer	Number of the DMP question answer that was selected	Integer	2
dmpScore	(not used for this release)[190]		

Appendix J. Survey Response XML Format (unscored)

The description of the XML (XSD) for the Survey patient response as a text component in the OBX segment of the HL7 message is illustrated in Figure 61; the XSD is not official, but is given as an example. As a historical note the survey response was originally submitted as an Excel spreadsheet. This genealogy should explain the strange XML and duplication between the HL7 message PID and the XML in the OBX segment.[191]

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:annotation>
    <xs:documentation xml:lang="en">
    VR-12 and Satisfaction Schema for VA Telehealth Vendors
      Corresponds to Version 1.9 of the VA Specification
   Last Updated: 2-17-2006</xs:documentation>
  </xs:annotation>
  <xs:element name="HTSurvey">
    <xs:complexType>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="Table">
```

[189] Scored DMPs will be required in the future.

[190] Scored DMPs will be required in the future.

[191] The duplication data between the XML and HL7 message segments will be corrected in the future.

```
        <xs:complexType>
         <xs:sequence>
           <xs:element name="patient_ssn" type="SSN" minOccurs="1" maxOccurs="1"/>
           <xs:element name="patient_icn" type="PatientICN" minOccurs="0" maxOccurs="1"/>
           <xs:element name="name_first" type="xs:string" minOccurs="0" maxOccurs="1"/>
           <xs:element name="name_MI" type="xs:string" minOccurs="0" maxOccurs="1"/>
           <xs:element name="name_last" type="xs:string" minOccurs="1" maxOccurs="1"/>
           <xs:element name="patient_dob" type="xs:date" minOccurs="1" maxOccurs="1"/>
           <xs:element name="enrollment_date" type="xs:date" minOccurs="1" maxOccurs="1"/>
           <xs:element name="disenrollment_date" type="xs:date" minOccurs="0" maxOccurs="1"/>
           <xs:element name="activation_date" type="xs:date" minOccurs="0" maxOccurs="1"/>
           <xs:element name="inactivation_date" type="xs:date" minOccurs="0" maxOccurs="1"/>
           <xs:element name="facility_number" type="FacilityNumber" minOccurs="1" maxOccurs="1"/>
           <xs:element name="vendor_number" type="VendorNumber" minOccurs="1" maxOccurs="1"/>
           <xs:element name="vendor_name" type="xs:string" minOccurs="1" maxOccurs="1"/>
           <xs:element name="care_coordinator_id" type="xs:string" minOccurs="0" maxOccurs="1"/>
           <xs:element name="care_coordinator_name_first" type="xs:string" minOccurs="0"
                       maxOccurs="1"/>
           <xs:element name="care_coordinator_name_MI" type="xs:string" minOccurs="0"
                       maxOccurs="1"/>
           <xs:element name="care_coordinator_name_last" type="xs:string" minOccurs="0"
                       maxOccurs="1"/>
           <xs:element name="device_name" type="xs:string" minOccurs="0" maxOccurs="1"/>
           <xs:element name="program_name" type="xs:string" minOccurs="0" maxOccurs="1"/>
           <xs:element name="current_dialogue_name" type="xs:string" minOccurs="0"
                       maxOccurs="1"/>
           <xs:element name="completed_date" type="xs:date" minOccurs="1" maxOccurs="1"/>
           <xs:element name="scheduled_date" type="xs:date" minOccurs="0" maxOccurs="1"/>
           <xs:element name="survey_accepted_status" type="AcceptType" minOccurs="0"
                       maxOccurs="1"/>
           <xs:element name="survey_title" type="SurveyTitle" minOccurs="1" maxOccurs="1"/>
           <xs:element name="survey_version" type="xs:string" minOccurs="1" maxOccurs="1"/>
           <xs:element name="Table" minOccurs="8" maxOccurs="unbounded">
            <xs:complexType>
               <xs:sequence>
                      <xs:element name="question_number" type="xs:string" minOccurs="1"/>
                      <xs:element name="answer" type="xs:string" minOccurs="1"/>
               </xs:sequence>
            </xs:complexType>
           </xs:element>
         </xs:sequence>
        </xs:complexType>
       </xs:element>
     </xs:choice>
   </xs:complexType>
  </xs:element>
  <xs:simpleType name="AcceptType">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Accepted"/>
      <xs:enumeration value="Refused"/>
      <xs:enumeration value="Delayed"/>
      <xs:enumeration value="Disenrolled"/>
      <xs:enumeration value="Refused Time out"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="SSN">
    <xs:restriction base="xs:string">
      <xs:length value="10"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="PatientICN">
    <xs:restriction base="xs:string">
      <xs:length value="17"/>
      <xs:pattern value="[0-9][0-9][0-9][0-9][0-9][0-9][0-9][0-9][0-9][0-9][V][0-9][0-9][0-9][0-
9][0-9][0-9]"/>
    </xs:restriction>
  </xs:simpleType>
```

```
  <xs:simpleType name="FacilityNumber">
    <xs:restriction base="xs:string">
      <xs:minLength value="3"/>
      <xs:maxLength value="7"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="VendorNumber">
    <xs:restriction base="xs:string">
      <xs:length value="5"/>
      <xs:pattern value="[2][0][0][T][0-9]"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="SurveyTitle">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Patient Satisfaction"/>
      <xs:enumeration value="VR-12 ADL"/>
    </xs:restriction>
  </xs:simpleType>
</xs:schema>
```

Figure 61: XML Data Format for Patient Survey Response

The data elements collected as part of the Survey patient response are listed in Table 107.

Table 107: Data Element Description for Survey Patient Response Submission

XSD Element	Description	Data type	Example
patient_ssn	Patient SSN for use as database index (secondary – if ICN is not available)		Table 4
patient_icn	Patient ICN for use as database index (primary)		Table 4
name_first	(to verify located patient)		Table 4
name_MI	(to verify located patient)		Table 4
name_last	(to verify located patient)		Table 4
patient_dob	(to verify located patient)		Table 4
enrollment_date	Date patient entered the program	Date	2004-1-31
activation_date			
facility_number	Servicing facility		
vendor_number	Vendor facility number	String	Table 82

XSD Element	Description	Data type	Example
vendor_name	Vendor name	String	Table 82
care_coodinator_name_first		String	
care_coodinator_name_MI		String	
care_coodinator_name_last		String	
device_name			
program_name			
current_dialog_name	DMP title	String	
completed_date	Date patient completed the survey	Date	2004-1-31
scheduled_date	Date patient was scheduled to respond to the survey	Date	2004-1-31
survey_accepted_status			
survey_title	Official title of the survey	String	(OBX-3.3)

XSD Element	Description	Data type	Example
survey_version	Survey version	String	(OBX-3.3)
question_number	Survey question number	Integer	6
answer	Answer number for the above question	Integer	2

Appendix K. Survey Response XML Format (scored)

(to be supplied)

Appendix L. VistA Standard Name Format

VistA has defined an standard name format that is to be the basis for all name complarisons. The basis for the name standardization is the VistA patch XU*8*134.

9.1 Background

The Veterans Health Administration (VHA) does not enforce a uniform procedure for recording names of persons in VistA. This has led to duplicate entries for individuals within systems and problems in matching records across systems. Name suffixes (Jr., III etc.) have added to the problems.

9.2 Purpose

The main impetus of this project is to support the National Provider Index (NPI) project that will assign a national number to every provider who provides service to the Department of Veterans Affairs. It is necessary to define a standard way for names to be entered into the NAME field (#.01) of the NEW PERSON file (#200). This will help in uniquely defining all providers in the file. Another benefit to this project will be the ability to uniquely identify computer users across various VA facilities. This will become especially important as the facilities do more data sharing, and as more computer users have access to data on computers across multiple facilities. It will also be a major step towards supporting data exchange with COTS/GOTS products that rely on a more detailed definition of person names via HL7 segments.

9.3 Brief Description

This patch does the following:

1. Changes the definition of the .01 field of the NEW PERSON file (#200).
2. Automatically runs the New Person Name Conversion as part of the POST-INSTALL ROUTINE (POST^XLFNAME). The conversion standardizes the names in the .01 field of the NEW PERSON file and parses the names into their component parts. (See "POST^XLFNAME: New Person Name Conversion" below for details.)
3. Introduces a file called the NAME COMPONENTS file (#20) to store the component parts of names.
4. Adds a pointer field to the NEW PERSON file to point to the NAME COMPONENTS file. The new field is NAME COMPONENTS (#10.1).
5. Introduces new Kernel API's useful for standardizing names in any file. Also introduces new Kernel APIs and a FUNCTION to display names in various formats.

9.4 Details

9.4.1 POST^XLFNAME: New Person Name Conversion

The New Person Name Conversion is run as part of the POST-INSTALL ROUTINE (POST^XLFNAME) of this patch. POST^XLFNAME loops through the entries in the NEW PERSON file and:

1. Converts the name stored in the NAME field (#.01) to the following standard form, if it is not already in standard form:
   Family_name,Given_name<space>Middle_name<space>Suffix
   In forming the standard name, the conversion routine makes the following changes to each name:
   a. Removes any text within parentheses (), brackets [], or braces {}. (If any such text is deleted, the original name with the parenthetical text is stored in the NOTES ABOUT NAME field in the NAME COMPONENTS file. After the conversion, you can use the search utility of VA FileMan to print out those entries in the NAME COMPONENTS file where NOTES ABOUT NAME is not null. See the VA FileMan Getting Started manual for more information on VA FileMan's Search utility.)
   b. Converts the name to uppercase.
   c. Moves any suffixes found between two commas immediately after the Family Name to the end of the name.
   d. In the Family Name (the portion to the left of the first comma):

i. Converts colons (:) and semicolons (;) to hyphens (-).

ii. Removes spaces and all other punctuation except hyphens.

e. In the other name parts (the portion to the right of the first comma):

i. Converts colons, semicolons, commas (,), and periods (.) to spaces.

ii. Removes all punctuation except hyphens and spaces.

f. Removes hyphens and spaces at the beginning and end of the name.

g. Replaces two or more consecutive hyphens or spaces with a single hyphen or space.

h. Converts Arabic numeral birth position suffixes 1ST, 2ND, 3RD, ..., 10TH to their Roman numeral equivalents I, II, III, ..., X.

i. Moves any suffixes immediately to the left of the first comma to the end of the name, before any suffixes already at the end of the name.

j. Moves DR to the end of the name if it is found immediately to the right of the first comma.

k. Removes the string "NMI" or "NMN" if it is used as the Middle Name.

l. If the length of the resulting standard name is greater than the maximum length (35) allowed by the input transform of the NAME field, the following algorithm is performed to shorten the name:

i. Truncate Middle Name from the right-most position until only the initial character is left;

ii. Drop Suffix;

iii. Truncate Given Name from the right-most position until only the initial character is left;

iv. Truncate Family Name from the right-most position.

v. Note that since the standard form of the name is never longer than the name being converted, this truncation would only occur if the name stored in the .01 field is already greater than 35 characters. This is unlikely, since the input transform restricts the name to 35 characters.

2. Parses the name into its component parts: Family (Last) Name, Given (First) Name(s), Middle Name, and Suffix(es). Those name parts are then stored in a new NAME COMPONENTS file (#20) brought in with this patch. In parsing the name into its component parts, the New Person Name Conversion looks for Suffixes immediately to the left of the first comma, and at the very end of the name. It also looks for the DR suffix immediately after the first comma and looks for any suffix between two commas immediately after the Family Name. The portion of the name to the left of the comma, less any Suffixes, is assumed to be the Family Name. After the

conversion routine accounts for all Suffixes, it looks at the portion of the name after the comma. It assumes that the first space-delimited piece is the Given Name. If any other pieces are left, the last one (rightmost) is assumed to be the Middle Name, and anything else is appended to the end of the Given Name.

3. Makes the following changes to the name components before they are stored in the NAME COMPONENTS file:
    a. Converts the name component to uppercase.
    b. In the Family Name, converts semicolons (;) and colons (:) tohyphens (-).
    c. In the other name parts (Given Name, Middle Name, and Suffix), converts semicolons, colons, and commas (,) to spaces.
    d. Removes hyphens and spaces at the beginning and end of the name.
    e. Replaces two or more consecutive hyphens/spaces with a single hyphen/space.
    f. Removes spaces after periods.
    g. Removes accent graves (`) and up-arrows (^).
4. Establishes a pointer from each entry in the NEW PERSON file to the corresponding entry in the NAME COMPONENTS file that contains the name parts.
5. Record in ^XTMP all changes that were made, and any potentially incorrect assumptions that were made in standardizing the name or parsing the name into its component parts. The purge date recorded in in the 1st ^-piece of ^XTMP("XLFNAME",0) is the current date plus 90 days.
6. Stores in the 4th ^-piece of ^XTMP("XLFNAME",0) the record number of the last record successfully converted. If the New Person Name Conversion is run again if, for example, an aborted installation is restarted, the conversion will continue on from this point, ratherthan from the beginning of the file. The PRINT^XLFNAME entry point, described below, can be used to print the information recorded in ^XTMP in step 5 above.

```
 ^XTMP("XLFNAME",0) = date run plus 90 days (purge date)
                ^date run
                ^Created by POST~XLFNAME (Post Install Conversion of XU*8.0*134)
                ^ien of last record successfully converted
 ^XTMP("XLFNAME",200,.01,rec) = Original Name
                        ^New (Standard) Name
                        ^Given (First) Name
                        ^Middle Name
                        ^Family (Last) Name
                        ^Suffix
  ^XTMP("XLFNAME",200,.01,rec,sub) = ""
 where,
    rec = The internal entry number of a record in the NEW PERSON file.
    sub = Any of the following:
        "DIFFERENT" The standard name is different from the original name.
        "FAMILY"    The Family Name started with ST<period>.
 (The conversion routine removes the period and the space,if any, that immediately follows.
For example, the name "ST. JAMES,JOHN" is converted to "STJAMES,JOHN".)
        "GIVEN"     There is no Given Name.
        "MIDDLE"    There are three or more names between the comma and the Suffix(es).
 (The conversion routine assumes that all name parts except the last between the comma and any suffixes are part of the Given Name.
                Only the last part is assumed to be the Middle Name.)
        "NM"        "NMI" or NMN" appears to have been used as the Middle Name.
(The conversion routine removes it from the standard name, and sets the Middle Name to null in the NAME COMPONENTS file.)
        "NUMBER"    A name part (other than a valid numeric Suffix) contains a number.
        "PERIOD"    The name contains periods that were removed to form the standard name.
        "PUNC"      The name contains punctuation other than hyphens or spaces that were removed to form the standard name.
        "SPACE"     The Family Name contains spaces that were removed to form the standard name.
        "STRIP"     The name contained parenthetical text that was stripped out of the name.
The conversion routine removes text enclosed in parentheses (), brackets [], and braces {}, and stores the original name with
             the parenthetical text in the NOTES ABOUT NAME field (#11) in the NAME COMPONENTS file.
 (For example, the conversion routine changes SMITH,JOHN (TRM) to SMITH,JOHN.)
        "SUFFIX"    This node is returned if:
                - Suffix(es) were found immediately to the left of the 1st comma.
     (The conversion routine moves them to the end of the name, before any suffixes already there.)
                - I, V, or X, and nothing else except valid suffixes appear immediately after the Given Name.
     (The conversion routine interprets it as a Middle Name.)
                - The name immediately after the Given Name appears to be a non-numeric suffix (IV, JR, SR, DR, MD,
                 ESQ, etc.) and everything after that also appears to be suffixes.
    (The conversion routine assumes that there are a Given Name and Suffixes, but no Middle Name.)
                - M.D. or M D is found at the end of the name, or before any valid suffixes at the end of the name.
                 (The conversion routine assumes that M and D are initials in the Given or Middle Name.)
                - The name part before any recognizable suffixes is more than one character in length and doesn't contain a "Y" or any
vowels.
                  (It is assumed to be a suffix.)
                - A suffix was found between commas immediately after the Family Name.
                 (The conversion routines moves it to the end of the name.)
        "TRUNCATE"  The standard name was truncated because it was longer than the maximum field length.
```

Figure 62: Information stored in ^XTMP by the New Person Name Conversion